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THE ANTERIOR PITUITARY: ITS SCIENTIFIC AND CLINICAL ASPECTS.¹

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I WISH to discuss tonight the anterior lobe of the pituitary gland, a subject which has become of increasing importance during the last few years to every medical man, no matter what be his particular interest.

I realize that in opening up this subject one invites the criticism that the busy practising doctor has not time to be interested in what he regards as still a subject for laboratory wrangling. This, I submit, is not true. The enthusiastic clinician in possession of the essential scientific facts is, I suggest, much better fitted to the intelligent treat-

ment of a patient than the man whose scientific interest starts with a sterile ampoule and finishes with a list of indications for its use.

This applies in particular to the subject of glandular therapy, for the drug market has been glutted within the past ten years with glandular extractions and preparations, in number legion, guaranteed to cure anything from dysmenorrhœa to a menopausal neurosis—certainly a state bordering almost on quackery.

Out of this endocrine "muck-heap" I hope to raise a number of established scientific facts, report a few clinical cases and suggest lines along which improvement may be looked for in the future.

Anatomical Considerations.

I should like first of all to consider briefly the anatomy of the gland. The cow's pituitary resembles the human gland closely enough in its main characteristics. There are a small posterior lobe of pale colour, the hypophyseal lake or cleft

¹ Read at a meeting of the Queensland Branch of the British Medical Association on July 7, 1933.

and the large pinkish vascular anterior lobe. The hypophyseal stalk attaches the pituitary above to the base of the third ventricle and below it becomes continuous with the posterior lobe.

The two lobes are distinct embryological entities, the anterior lobe being derived from Rathke's pouch (stomatodæum) and the posterior from the third ventricle.

It is interesting to note that the pituitary lies in the *sella turcica* surrounded on five sides by bony walls. This is important from the point of view of X ray diagnosis of a tumour. It is important also from another point of view. If we compare the pituitary and the thyroid we can imagine how readily an acute swelling of the one can be accommodated by the soft tissues of the neck. This is not so with the pituitary and an acute or sub-acute swelling such as might conceivably be brought about by congestion of the gland or inflammatory trouble would possibly lead to damage to the internal structure of the gland.

This has been shown experimentally to be the case. The *sella turcica* in the goat is deep, and shallow in the rat. Different degrees of damage can be produced by the same amount of intracranial pressure in both animals.

This is a possibility in the elucidation of pituitary disorders in which no tumour can be detected.

The change during pregnancy is interesting. The gland always increases in size during pregnancy, growing from a weight of 0.6 gramme to 0.85 or even 1.0 gramme. It is due entirely to the anterior lobe and the gland furthermore never completely returns to its previous size. This is important in the X ray diagnosis of a tumour in a woman who has had several pregnancies.

The histological features of the two lobes are also distinctive. The posterior lobe consists mainly of nervous tissue, glial cells and fibres and a certain amount of connective tissue.

The question of actual nerve cells is the matter of investigation.

The anterior lobe is essentially glandular in type, partly solid and partly hollow or tubular and very rich in blood vessels, which, I take it, is important in view of the fact of its being an organ of internal secretion. It is also very cellular, comprising mainly: (i) chromaffin cells, (ii) chromophobe cells, depending on their reaction to staining processes.

The anterior lobe is also rich in colloid and glycogen, thereby resembling the thyroid.

The *pars intermedia* or middle lobe is clearly defined in animals, but not so clearly in the human. The characters differ according to age.

Anterior Pituitary Function.

And now as to the function of the anterior lobe of the pituitary.

According to our present knowledge the anterior lobe has three definite functions: (i) It controls growth of the individual. (ii) It controls and

maintains genital development. (iii) It influences the thyroid.

With regard to the growth and thyroid factors, I have not time to go into the experimental aspect of these questions. The influence on growth was the earliest function of the pituitary to be discovered and that on the thyroid the most recent. I should simply like to state that experimental extirpation of the anterior lobe retards or prevents general bodily and genital development, while removal of the posterior lobe is not associated with any gross disturbance in the development of the laboratory animal.

Much of interest could be said here with regard to experimental dwarfism and gigantism—our Carneras and so forth—but time will not allow.

The second question, that of genital development, is really one of the functional relationship of the anterior lobe to the rest of the endocrine system, and in particular the ovaries, testes and also to the thyroid and thymus.

To present as clear as possible a picture of this somewhat extensive field and of apparently disconnected organs, I thought a brief review of the experimental work which has been responsible for the elucidation of the problem would be the most logical course to adopt.

And so, with your permission, I should like to introduce to you a most valuable animal, the female white mouse.

And for the moment we shall leave the pituitary.

It is about forty-six years ago since French research workers demonstrated that the cyclical recurrence of a condition of œstrus in female animals was associated with changes in its genital organs.

The earliest feature to be observed was a regularly recurring cycle of changes in the vaginal secretion and the vaginal epithelium. This is associated possibly with the attraction of the male and insemination. This was first accurately worked out by Stockard and Papanicolaou. Four definite stages can be seen: (i) œstrus, characterized by purely cornified epithelial cells without any nucleus or internal cellular structure; (ii) metœstrus, showing epithelial cells and a few leucocytes; (iii) diœstrus, with a few epithelial cells and many leucocytes; (iv) proœstrus, showing commencing cornification of the epithelial cells preparatory to the reappearance of œstrus.

These pictures represent merely the condition of the vaginal epithelium, but their importance is that they indicate corresponding changes in the uterus and more fundamental changes in the ovaries. In other words, they are the direct result of different phases of ovarian function.

I feel that although one cannot demonstrate the same clear cut changes in the human vagina, there is just as definite a functional relationship between the vagina and the ovaries. I have had cases of troublesome leucorrhœa and others of intractable *pruritus vulvæ* with slight menstrual irregularities

and no pathological cause to be found. They have responded most favourably to injection of ovarian hormone after other methods had apparently failed. I have felt that the clearing up of the conditions was more than a mere coincidence, basing my belief on the experimental evidence I have outlined above.

For some time we were satisfied to leave this matter settled as a purely pelvic one, but eventually the question arose: What is it that sets the ovarian function in motion? Light was first thrown on this subject by Evans and Long in America, who found that implantation of a piece of anterior lobe in the female mouse was followed by an increase in size and development of the ovaries.

It remained for Aschheim and Zondek only a few years ago to make the remarkable discovery that implantation of a piece of anterior lobe in an infantile female white mouse produced in a few days changes in the ovaries and *corpora lutea*. The uterus and vagina also showed adult features. And so we arrive at the present state of our knowledge, which is shown by the accompanying diagram.

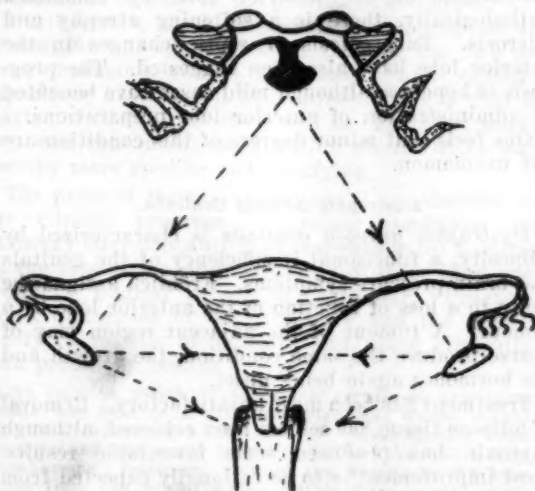


Diagram representing the functional relation of the anterior pituitary to the female genitalia. "The anterior pituitary is the motor of sexual function." (After Aschheim and Zondek.)

Two important basic facts are the outcome of this piece of experimental work. First, the infantile female white mouse constitutes a reliable and specific test for the anterior pituitary hormone. This has been amply proved later. Secondly, the difference in the modes of action of the pituitary and the ovaries, is indicated. The pituitary acts on the ovaries and through them on the uterus and vagina; and so it would appear pointless to administer anterior pituitary hormone to a woman whose ovaries have been removed or to a woman whose ovaries either by disease or senility are beyond stimulation or development.

Clinically, I have found that amenorrhœa and scanty menstruation in a person under twenty-five years of age can often be improved by anterior

lobe treatment whereas after thirty, as a rule, amenorrhœa does not lend itself so readily to the same therapy.

The question of glandular support during the period of natural development is, I think, an important factor.

The ovarian hormone acts only on the uterus and vagina and has no effect on the ovary itself. It would appear irrational therefore to administer ovarian hormone in an endeavour to influence the ovary itself.

These facts should, I think, help us to some extent in the rational application of the hormone preparations at our disposal to-day.

Following on the discovery that implantation of a piece of anterior lobe produced a sexually mature animal, Aschheim and Zondek investigated the body fluids and the further really astounding discovery was made that a similar result in a mouse could be obtained by the injection of blood or urine from a pregnant woman. Note that it was the blood or urine of only the pregnant woman.

And thus was constituted what we now know as the Aschheim-Zondek pregnancy test. I am not going into this in detail. I should simply like to state that by injection of a small amount of urine (1.8 to 2.4 cubic centimeters) of plain untreated urine into an infantile female white mouse and by examination of the ovaries and uterus of the mouse one hundred hours later, an answer can be given on the question of pregnancy, an answer which is practically 100% reliable. The test becomes positive as early as three to four days after the first period is missed.

As a biological test it stands preeminent, being more reliable than the Wassermann test.

The importance of this discovery of a means of detecting the anterior pituitary hormone is tremendous. Certainly it is only the beginning of our understanding of the sexual endocrine system, but it has established a few facts, cleared up a few questions, and created a completely new biological standpoint.

In the diagnosis of pregnancy and other pelvic conditions, in pituitary tumours and disorders—acromegaly, hypophyseal adiposity and cachexia (including particularly early and minor degrees of these conditions)—it has a big future. I am confident that when we know the chemical nature of this hormone, its detection will be a relatively simple matter and the sphere of usefulness of the test considerably enhanced.

Clinical Aspects of the Anterior Lobe.

The clinical aspects of the anterior lobe make such a big subject that I shall be able only to review a number of interesting conditions with particular reference to a few.

The disorders of the pituitary function are essentially irregularities in its hormone secretion. They are many and varied and it is difficult to give a clear cut and satisfactory description of their

nature and treatment until our experimental knowledge and clinical analysis are more complete.

I shall mention merely some conditions known clinically (most of them) for a long time in which, however, recent work has changed our ideas of their pathogenesis.

Acromegaly.

Acromegaly is a striking condition. It is associated initially with a hypertrophy of the sexual organs and later with atrophy and complete disappearance of sexual functions. In this condition it would appear that some factor is at work which in the first place leads to an overproduction of the growth and sex hormones of the anterior lobe, ending in their complete exhaustion.

It is not always a tumour. We see cases of acromegaly without a tumour, and of course cases of pituitary tumour without acromegaly. It is in a condition such as this that the remarks made earlier in the paper as to a swelling or oedema apply. Such inflammatory or other trouble can conceivably bring about the requisite damage to the essential cells of the anterior lobe. Apropos of acromegaly, it is interesting to note that while the commonest cause of enlargement of the anterior lobe is pregnancy, in which it occurs universally with an absolute flooding of the blood with anterior pituitary hormone, cases of "pregnancy acromegaly" are very seldom seen. Such cases when they do occur, rapidly clear up in the puerperium.

The basal metabolic rate is usually normal in acromegaly. This is of importance in all pituitary conditions as indicating to some extent any functional influence of the anterior lobe on the thyroid.

Anterior Lobe and Thyroid.

That there is a strong relationship between the pituitary and thyroid is a fact that will be, one might say, already is, established. Further research will reveal, I think, just as close a connexion as has been shown to exist between pituitary and ovaries. It is simply another link in the endocrine chain.

The work already done in this direction has been put on a sound basis by the Animal Breeding Research Institute in Edinburgh and has since been taken up in Germany.

It has long been the practice to reduce adiposity by the administration of thyroid extract, but clinicians can now demonstrate just as good results in these cases by administration of anterior pituitary preparations. Whether these act directly on the body tissues or by the medium of the thyroid is a question which further research will decide. It is, I think, an attractive speculation to consider the process as being in some way analogous to the action of the anterior lobe on the uterus and vagina *via* the ovaries.

Dwarfism may occur as a result of disturbance of the anterior lobe in early childhood, marked retardation of genital development and a lowering of

the basal metabolic rate being probably the result of the loss of the growth hormone, which we know finds its source in the anterior pituitary.

Pituitary Cachexia.

The amazing condition known as pituitary cachexia has been described so recently as 1917 by Simmonds. When well developed, it is characterized by extreme cachexia, a premature senility—thinning and greyness of hair and finally by its falling out—loss of teeth and trophic changes in the skin and nails; the temperature is lowered and the pulse slowed. The body becomes more masculine than feminine. Complete genital atrophy ensues. The basal metabolic rate is very much lowered and the urinary output amazingly diminished. This contrasts with the urine in *diabetes insipidus* which is probably due to some parapituitary damage. The condition comes on usually after a confinement associated with very much loss of blood.

Simmonds postulates as the cause a complete destruction of the anterior lobe by embolism. Pathologically, there is a softening atrophy and sclerosis. Tuberculosis or septic changes in the anterior lobe have also been suggested. The prognosis is hopeless, although mild cases have benefited by administration of anterior lobe preparations.

One feels that minor degrees of this condition are not uncommon.

Dystrophia Adiposa Genitalis.

Dystrophia adiposa genitalis is characterized by adiposity, a functional insufficiency of the genitals and brain pressure symptoms. Fröhlich assigns the cause to a loss of function of the anterior lobe by a tumour. A tumour of the adjacent region may of course produce the same condition, the growth and sex hormones again being upset.

Treatment has been most unsatisfactory. Removal of adipose tissue has seldom been achieved, although thyroxin has produced some favourable results. Most improvement is to be rationally expected from treatment with anterior pituitary hormone.

In this connexion, I should like to quote the experimental work of Ehrhardt. This consisted of six cases of *dystrophia adiposa genitalis*, in which he implanted subcutaneously the anterior lobe of the ox pituitary. Menstruation was reestablished and in one case on subsequent laparotomy the ovaries were found to be very much enlarged. This is a most valuable experiment because it confirms our animal experiments and assigns a deeper significance to them.

One is naturally hesitant about making far-reaching conclusions from a few cases, but it would seem that good clinical results are not so much the result of lack of an understanding of the pathogenesis of the condition as a lack of suitable anterior lobe preparations. This is a true substitution therapy. I might add that recently similar good results with "Prolan" and "Praehormon" have been reported.

The questions of regional adiposity and of the hypogenital adiposity of the menopause provide food for much productive thought, particularly in these days of the slimming craze.

Remarkable slimming results are claimed on the continent by the injection of a pluriglandular preparation, "Lipolysin", the chief advantage claimed being that the adiposity does not return on cessation of treatment. The return of the fatness is, of course, the disadvantage of dietetic treatment.

Whole sanatoria on the continent are devoted to this therapy, but the teutonic form would appear to clothe itself more lavishly with adipose tissue than does our average Australian figure.

Anterior Pituitary Therapeutics.

The therapeutic aspect of these conditions, you will say, is unsatisfactory and depressing. At present this is true. But let us remember that our ability to demonstrate the presence of the anterior pituitary hormone is an achievement of only five years' standing, and that a reliable anterior lobe preparation is only in the process of evolution.

Furthermore, these anterior lobe preparations at present at our disposal must contain the two or more hormones which experiment and clinical experience have shown to be present. It is only a matter of time before these will be capable of selection and concentration, and this should make our therapy more specific and satisfying.

The price of these preparations is an obstacle to our clinical progress. Economic conditions in Germany have probably been responsible for holding up the production and marketing of more than one product. I speak of one in particular, "Praehormon", quantities of which I have had the opportunity of testing biologically and using clinically with promising results.

One case in which "Praehormon" produced promising results was that of a girl aged eighteen, whose weight was 94.5 kilograms (15 stone). Menstruation was irregular and had never lasted for more than half a day. "Praehormon" treatment reduced the weight by 9.4 kilograms (one and a half stone) within four months without dieting, and menstruation has recurred regularly up to the present, lasting a full three days on each occasion.

There is one field, however, in which our results are more satisfactory: In amenorrhœa, which occurs not infrequently between puberty and twenty years of age.

These forms of amenorrhœa are almost all of anterior lobe origin, and according to our present knowledge an anterior lobe preparation is the rational method of treatment, the "Prolan" stimulating the production of the follicular hormone in the ovary, which in turn stimulates menstruation.

I have had good results in several cases using "Prolan." The clinical application of "Prolan" to the treatment of amenorrhœa and menorrhagia is of interest when it is considered that Zondek three or four years ago considered that the anterior pituitary sex hormone ("Prolan") was composed really of two parts: (i) "Prolan" A, which stimulated the formation of ripe follicles in the ovary,

and (ii) "Prolan" B, which stimulated the formation of *corpora lutea*.

Oligomenorrhœa would appear to be usually an insufficiency of the anterior lobe hormone of a lesser order.

Menorrhagia is also influenced by "Prolan". This may appear illogical, following on what I have just said about amenorrhœa. The "Prolan" in this case, however, does produce good clinical results, which depend probably more on the stimulation of the ovary to form *corpora lutea*. These in their turn influence the excessive bleeding of the uterine endometrium.

These ovarian hormones form a very definitely established group whose actions are more specifically known to us.

At this stage I should like to show you the picture and tell you the story of a monkey and guinea-pig, as observed and recorded by Ehrhardt.

A female monkey had been treated by "Praehormon" with an obvious enlargement of its mammary glands (and as was shown later) of its ovaries. At this stage the monkey was observed to develop a strong affection for a young guinea-pig which happened to gain entrance to the monkey cage. The affection was definitely maternal, extending even to an attempt to suckle the pig, nursing it continually and protecting it from the attacks of other monkeys. Whether this awakened maternal instinct was due to the "Praehormon" treatment one cannot definitely say. I would ask you to draw your own conclusion. This fact, however, is significant, that ovariectomy of the monkey later was followed by a complete disregard for its former charge, ultimately ending in the guinea-pig being killed by one of the other monkeys.

Although not strictly scientific in its significance, I should like to mention that several married women after treatment for menstrual insufficiency and irregularity have volunteered the information that their sexual desire and marital relationships have been definitely improved. Two of these patients were women of thirty-eight and thirty-nine years respectively, in whom a condition of frigidity had previously existed. This fact, I take it, rather supports the claim of some pathologists as to the presence of interstitial cells in the ovary, with an internal secretory function.

It would be worth while trying anterior lobe as an alternative to Steinach's operation in the male. I leave the matter there. It is at least interesting, and may be important.

I should like to conclude with a few points of practical importance.

First, the mode of administration of anterior lobe preparations: Experimental evidence would seem to indicate that injection is the only reliable means of administration. Anterior lobe hormones are water soluble and the injections are quite painless. I have had no after effects. This is a contrast to the old *corpus luteum* products in an oily solution. Allow me to demonstrate by quoting two clinical experiments carried out by Ehrhardt.

1. *Blood transfusion from pregnant to non-pregnant woman.*—Six hundred cubic centimetres of blood were transfused from a pregnant woman to a non-pregnant woman, and the urine was

examined by the Aschheim-Zondek test for evidence of the anterior pituitary hormone. This appeared as early as fifteen minutes after transfusion, and was completely excreted in twenty-four hours. Intramuscular injection of "Praehormon" was followed in a similar way by a rapid excretion of the hormone by the kidneys.

2. *Oral Administration.*—In this experiment with which I was associated, quantities of pituitaries from cattle were obtained from the abattoirs. The anterior lobes were shelled out and "cooked", care being taken not to raise the temperature above 60° C., above which the hormone is destroyed. They were eaten with salad and made quite a palatable dish. No ill-effects having been observed, the dish was served to non-pregnant women and the blood and urine examined by the Aschheim-Zondek test. At no time could any evidence of the presence of the hormone be obtained, in either blood or urine, so that one felt that absorption of the hormone from the alimentary tract was very doubtful. The same negative result followed oral administration of "Praehormon". I might state that no ill-effects were observed at any time.

3. *Rectal Administration.*—Rectal administration likewise was followed by no evidence of absorption of the hormone, judging by the effect of subsequent injection of the blood and urine into the test animal, the infantile female white mouse. Therapeutic results, however, do not agree with the experimental evidence because several clinicians have reported improvement in the symptoms of patients after oral and rectal administrations of the anterior lobe product. This is encouraging, and of course of great practical importance.

Dosage.

This brings me to my last point, that of dosage. The Aschheim-Zondek test will detect the anterior lobe hormone only in the blood and urine of a pregnant woman. During this state there is a tremendous quantity of the hormone in these body fluids. The test, however, is not capable of detecting the presence of the hormone in the blood or urine at any time other than pregnancy.

That this hormone must be present, at any rate in the blood stream at ordinary times is, I think, a reasonable assumption. In other words, there must normally be very small amounts of this hormone needed to carry on the normal functions of the body. And from this reasoning I suggest that it would appear unnecessary to give large doses of anterior lobe.

I would go further and suggest that large and repeated doses may even be harmful. My reason for saying this is that experimentally by giving "Prolan" to female mice over several weeks, the ovaries can be converted into one large mass of *corpora lutea*, in other words, practically every ovarian follicle can be converted into a *corpus luteum*. This amounts virtually to sterilization.

Whether this would apply as well to the human one cannot say, but from the therapeutic point of

view, repeated small doses would appear more physiological. This contrasts with the ovarian hormone therapy. No ill-effects either experimentally or clinically have been known to follow large and continued dosage with the ovarian follicular hormone.

Conclusion.

I am aware that what has been said to-night constitutes merely an introduction to the subject of endocrinology. It is, I confess, very incomplete. The subject bristles with problems, but it is brimful also of prospects. At present all one can say is that a few facts have been established and a few questions answered.

Improvement should follow (i) careful analysis of each individual case, (ii) production at a reasonable price of biologically proved anterior lobe products.

I feel sure that the future of medicine lies to a very great extent in the better understanding of the endocrines and vitamins.

Acknowledgements.

I should like to record here my indebtedness to the Walter and Eliza Hall Trust (University of Sydney) and my appreciation of the courtesy of Geheimrat-Professor Dr. Seitz and his assistant, Dr. Karl Ehrhardt of the Universitäts, Frauenklinik, Frankfurt am Main.

THE CLINICAL VALUE OF THE ELECTRO-CARDIOGRAM.¹

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THE possibility of investigating the electric currents produced by the cardiac contractions was first recognized in 1843, but it was not until 1908 that the first clinical studies of the electrocardiogram of the human heart were published by Einthoven, and not until 1918 that the characteristic changes of the electrocardiogram resulting from the disturbance of myocardial nutrition following coronary artery occlusion were recognized.

When it is realized that only twenty-five years have elapsed since the first studies were published by Einthoven, and fifteen years since the changes resulting from coronary artery occlusion were recognized as being due to this cause, it will be appreciated that this diagnostic aid is only of very recent origin.

It will not be surprising therefore to learn that the significance of various departures from normal are only now receiving their correct interpretation, and that much still remains to be accomplished.

¹Read at a meeting of the Section of Medicine of the New South Wales Branch of the British Medical Association on September, 14, 1933.

As a result of many improvements in the mechanical apparatus necessary to take an electrocardiogram, its clinical use has become gradually more widespread, until now, with the perfection of the modern type of instrument, and the ease with which records may be taken, its value as a diagnostic agent is generally recognized.

It is possible to take an electrocardiogram at the patient's bedside, either at his own home or in hospital, without causing the slightest distress—in fact, in one instance I have taken a record while the patient slept.

A careful history and clinical examination, aided in some cases by radiographic examination, remain the mainstay of cardiac diagnosis, but in many cases the electrocardiogram is the last court of appeal.

It should be remembered that a perfectly normal electrocardiogram may be obtained in the presence of serious heart disease, but, on the other hand, an abnormal electrocardiogram may be obtained when there is an absence of any clinical indication of heart disease, and in such an instance the evidence of the electrocardiogram is indisputable. It is a safe axiom that, except in the case of a patient obviously suffering from a cardiac neurosis, or a patient with an entire lack of abnormal symptoms and signs, a normal electrocardiogram may not offer any evidence of value; whereas a definitely abnormal electrocardiogram, even in the absence of abnormal clinical signs and symptoms, is positive and definite evidence of some cardiac defect.

The electrocardiogram will show accurately the point of origin of the stimulus to contraction of the heart, the path through the conducting mechanism and the direction of spread of the impulse through the myocardium; further, it will give an indication of any change in the relative masses of the ventricles, and will in most cases of coronary artery occlusion give evidence of some interference with the nutrition of the myocardium. Further, the record is taken in such a way that accurate time measurements to within 0.02 of a second may be made.

The actual force of the ventricular contraction, and the mechanical efficiency of the heart in pumping blood cannot be judged by an electrocardiogram. An electrocardiogram will give no indication of the reserve power of the heart, nor will it diagnose the character of a valvular lesion. It may or may not show a departure from normal in the condition known as alternation of the heart beat. It will aid in prognosis only by its assistance in diagnosing accurately the lesion, except in conditions such as coronary artery occlusion, where progressive electrocardiographic records are often of very great value.

It will be the purpose of this paper to indicate the type of case in which an electrocardiogram is of clinical value, to point out certain changes, the significance of which is as yet imperfectly understood, and lastly, to indicate the paths along which further research work is necessary.

A demonstration of the variations of the electrocardiogram in all cardiac disorders cannot, of course, be included in a paper such as this, nor can the reasons for the abnormalities of the electrocardiograms, which will be shown, be discussed. The records have been chosen as being those most suitable to illustrate the various points mentioned, and in many cases will be found to show abnormalities other than those to which reference will be made. In order to keep the length of the paper within reasonable limits, few actual case histories can be mentioned, but it is hoped that the discussion will include reference to actual cases in which an electrocardiogram was found to be of value.

The Principles of Electrocardiography.

For the benefit of those who are not familiar with electrocardiography, and in order that they may appreciate more fully the changes in the electrocardiograms to be shown, I will, I feel sure, be pardoned if I first briefly indicate its basic principles.

The contraction of a muscle fibre is always accompanied by changes of electrical potential which can be converted into electric currents and recorded by a sensitive galvanometer. The heart consists of a mass of muscle fibres arranged in a definite order, and comprising two groups, the auricles and the ventricles, with a conducting mechanism uniting them. With the patient at rest, the currents resulting from the contractions of the various muscle fibres of the heart are conveyed to the instrument by means of leads, furnished with suitable electrodes, in the following universal order:—Left arm and right arm, Lead I; right arm and left leg, Lead II; left leg and left arm, Lead III.

The variations in current consequent on the cardiac contractions cause a movement of the galvanometer string, which, by means of a small attached mirror, reflects a beam of light on the shutter of a camera. The movements of this beam of light are photographed on a strip of film which is passing the shutter of the camera at the accurate speed of one inch per second. The resultant picture is termed an electrocardiogram (see Figure I).

The instrument being previously standardized so that one millivolt of current will cause a deflection of the beam of light on the film of exactly one centimetre, an electrocardiogram is taken from each of the three leads, and the film obtained is developed and then mounted in a folder.

The vertical lines in the background of the folder represent the time in $\frac{1}{5}$, $\frac{1}{10}$, and $\frac{1}{25}$ of a second, and the horizontal lines the amplitude in millimetres. The normal electrocardiogram shows series of groups of waves, representing complete cardiac cycles, the individual waves of which have been arbitrarily named *P*, *Q*, *R*, *S*, and *T*. *P* represents the auricular deflection, and is related to auricular systole. Normally it is upright in Leads I and II, but may be upright, diphasic or inverted in Lead III of a normal electrocardiogram.

The *QRS* group represents ventricular systole. It is due to an impulse which has traversed the auriculo-ventricular bundle—its main right and left branches and their arborizations. Normally the direction of this complex is upwards, but its form depends on the course of the impulse, and may vary from different causes. All parts of the *QRS*

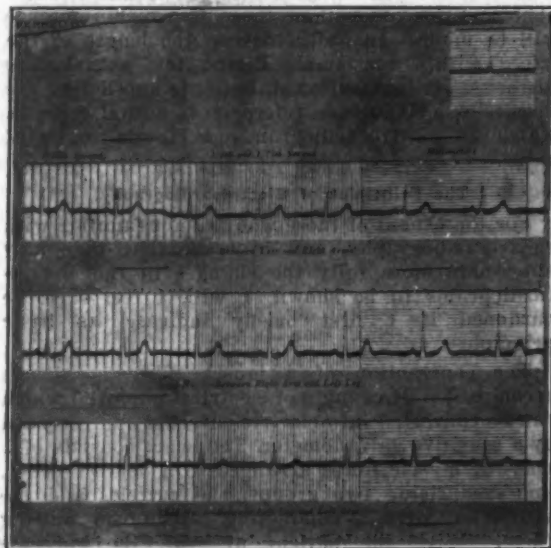


FIGURE I.
Normal electrocardiogram.

complex should not measure more than 0.1 second in duration. The *T* wave is now generally considered to represent the termination of ventricular systole, or the subsidence of electrical excitability in the myocardium forming the ventricles. It should point upwards in Leads I and II in normal hearts, and be blunt or rounded in form; it may be inverted in Lead III.

The interval between the commencement of the *P* wave and the commencement of the *QRS* group represents the auriculo-ventricular conduction time, and should not exceed 0.20 of a second in duration.

The Normal Heart.

In the absence of abnormal clinical signs and symptoms, a normal electrocardiogram is of importance in the case of a patient suffering from a cardiac neurosis. The report of a normal electrocardiogram having been obtained is much more likely to impress such a patient as to the absence of any organic cardiac defect than a mere verbal assurance.

On occasion, a physician is sometimes doubtful of the diagnosis of cardiac disorder which has been previously made as the result of more or less vague symptoms, and seeks electrocardiographic assistance. The report of a normal electrocardiogram, coupled with the absence of definite abnormal clinical signs and symptoms, enables him to reassure the patient

as to the absence of cardiac disease, and to release him from unnecessary worry and restrictions.

Acute Infections.

In certain of the acute infections the electrocardiogram is of value.

The presence of minor degrees of heart block in rheumatic fever is not uncommon, and the important clinical fact is that digitalis may increase this block to a dangerous degree.

In diphtheria, arrhythmias of some form or other are not uncommon, most of them may be accurately diagnosed clinically, but, in addition, various abnormalities of the electrocardiogram, such as heart block or inversion of the *T* waves in Leads I and II are frequent. These changes are definite evidence of a cardiac lesion, and have a considerable bearing on the prognosis and period of convalescence. A number of these changes cannot be detected by any other means.

Congenital Abnormalities of the Heart.

In congenital abnormalities of the heart the electrocardiogram is not of very great value (see Figure II). In the majority of cases well marked right ventricular preponderance is shown, but in cases with a patent *foramen ovale* no departure from normal is found.

Congenital transposition of the heart gives rise to a quite typical change in the electrocardiogram, suggesting right ventricular preponderance, but in reality it is as if a normal Lead I were turned upside down, the curve in Lead II is what is ordinarily obtained by Lead III, and that by Lead III what is ordinarily obtained by Lead II.

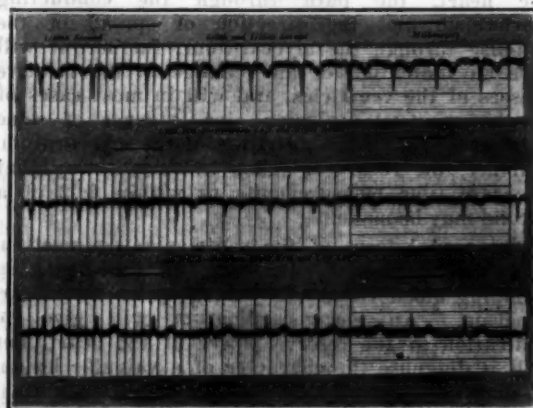


FIGURE II.
Dextrocardia.

The typical electrocardiogram here described will clearly distinguish a congenitally transposed heart from one which lies on the right side as a result of pleural or mediastinal disease. It may be of interest to note that on one occasion a right-sided heart was proved, by means of an electrocardiogram, to be due to congenital transposition, and not to pleural disease which was present at the base of the right lung.

Disturbances of Rhythm.

In disturbances of rhythm an electrocardiogram will in every case accurately diagnose the condition, and in so far as these cases may nearly all be differentiated clinically, I will consider only briefly the various groups and indicate the type in which electrocardiographic assistance is indicated.

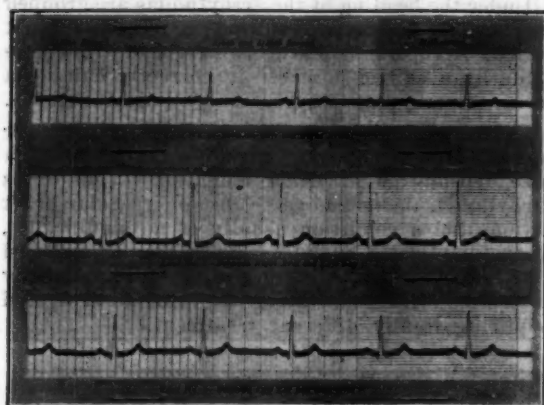


FIGURE III.
Simple bradycardia. Rate, 53 per minute.

Bradycardia.

A simple bradycardia with a ventricular rate at rest of about fifty per minute is not uncommon, and may be confused with a nodal rhythm of the same rate, a 2:1 heart block in which a ventricular rate of about fifty per minute is usual, or auricular fibrillation with a slow ventricular rate and almost regular rhythm,

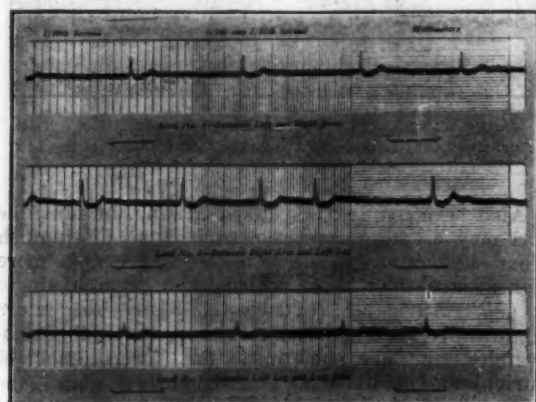


FIGURE IV.
Bradycardia due to slow ventricular response in auricular fibrillation. (Note also effect of digitalis on T waves in Leads I and II.)

The differentiation between sinus and nodal rhythm is seldom important, and is clinically impossible, whereas the distinction between these two conditions and slow ventricular response in auricular fibrillation is of great importance and may be difficult by ordinary clinical means (Figures III, IV, and V).

In the case of 2:1 heart block we find that following exercise the rate frequently doubles, and later returns to normal, in distinction to the other types of bradycardia, where, under similar conditions, the rate gradually accelerates following exercise and gradually returns to normal on resting,

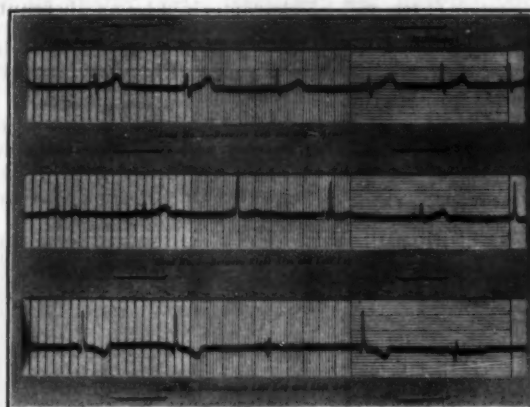


FIGURE V.
Bradycardia of unusual rhythm due to wandering pacemaker and ventricular "escape". Rate, 55 ± per minute.

Tachycardia.

Under the heading of tachycardia will be considered simple tachycardia, paroxysmal tachycardia, both auricular and ventricular in origin and auricular flutter, that is, conditions in which the rate is rapid but the rhythm regular. The differentiation of these conditions is of importance, owing to their diverse significance, and although in many

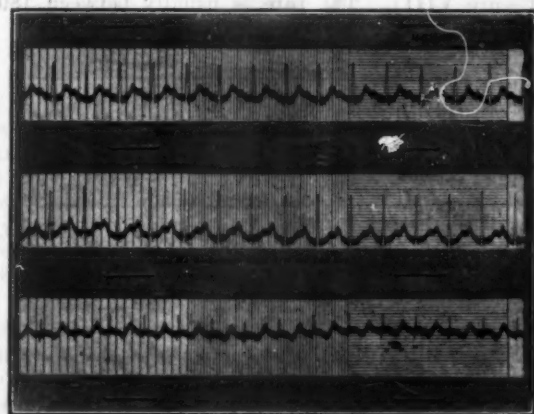


FIGURE VI.
Simple tachycardia in a case of exophthalmic goitre. Rate, 140 per minute.

cases the diagnosis may be made accurately without the aid of graphic methods, on occasion, difficulty may arise which can be satisfactorily solved only by this means.

A pulse rate of 150 or more is not uncommonly found in emotional states, fever and toxic goitre, and is simply an acceleration of a normally contracting heart (Figure VI).

In paroxysmal auricular tachycardia the rate is usually over 150 per minute, though it may be less, and is due to the activity of an ectopic area of increased irritability in the auricle which acts in place of the sino-auricular node. In effect, in the electrocardiogram we find a regular series of auricular extrasystoles characterized by an aberrant form of the *P* wave (Figure VII).

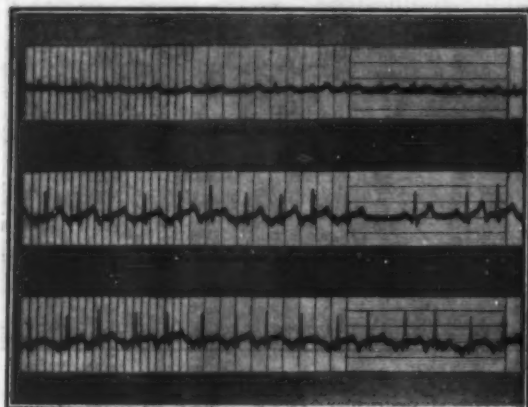


FIGURE VII.
Paroxysmal auricular tachycardia. (Note two normal auricular complexes in Lead II.) Rate, $140 \pm$ per minute.

Paroxysmal ventricular tachycardia usually occurs as a result of some severe cardiac disaster, and most frequently in association with coronary artery occlusion; its diagnosis is of great importance owing to the efficacy of quinidine in treatment (Figure VIII). The rate is usually between 180

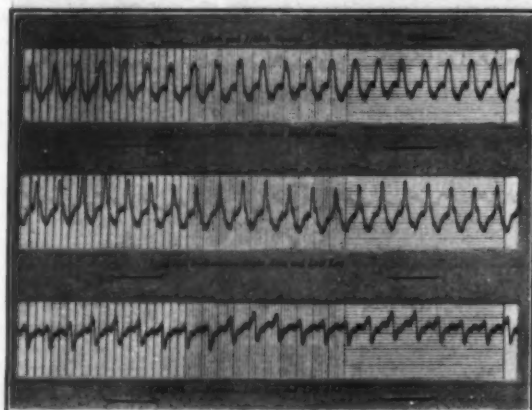


FIGURE VIII.
Paroxysmal ventricular tachycardia. Rate, 210 per minute.

and 200 per minute, and the electrocardiogram shows series of ventricular extrasystoles arising from the one focus. Even so, there are sometimes slight variations in rhythm which may be detected clinically. In some cases the rhythm may be markedly irregular, owing to the extrasystoles arising from multiple ventricular foci.

In auricular flutter there is a disturbance of auricular activity which produces a quite typical electrocardiogram; various degrees of block may occur, but the ventricular rate is usually about or lower than 150 per minute (Figure IX).

The Arrhythmias.

Under the heading of the arrhythmias are grouped the various disorders resulting in irregular heart action. According to Pardee, an error of 5% will be made by a skilled observer in correctly naming a series of arrhythmias by ordinary clinical methods.

Determination of the actual type of disorder present is important, because the treatment of a case depends on an exact diagnosis. Thus sinus arrhythmia, the commonest cause of irregular heart action, and a condition usually of no significance, when complicated by extrasystoles, may be confused with auricular fibrillation, a condition usually associated with definite organic heart disease, and requiring totally different treatment.

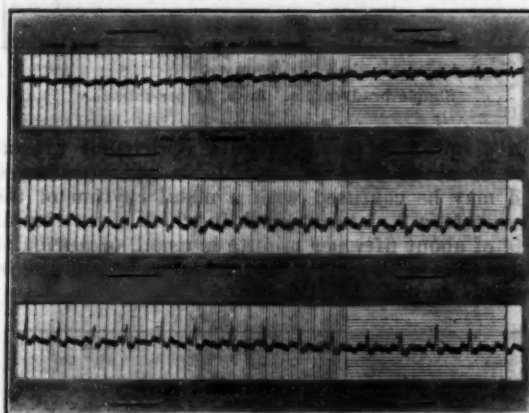


FIGURE IX.
Auricular flutter with 2:1 block. Ventricular rate, 140 per minute.

Also series of extrasystoles arising in multiple foci may create a condition difficult to distinguish from auricular fibrillation, and are of more significance than those which arise from a single focus. Auricular extrasystoles are of more significance in some cases than ventricular extrasystoles, and are sometimes the forerunner of auricular fibrillation. Frequently also the conversion of auricular fibrillation to normal mechanism may be missed owing to the fact that digitalis medication has induced so many extrasystoles.

Impure auricular flutter, where the ventricular response is irregular, may be difficult to distinguish from auricular fibrillation. An important differentiation also is between auricular fibrillation and partial heart block with dropped beats, since the treatment of the two conditions is so radically different.

Tachycardia due to rapid ventricular action in auricular fibrillation may be difficult to distinguish clinically from other forms of tachycardia (Figure X).

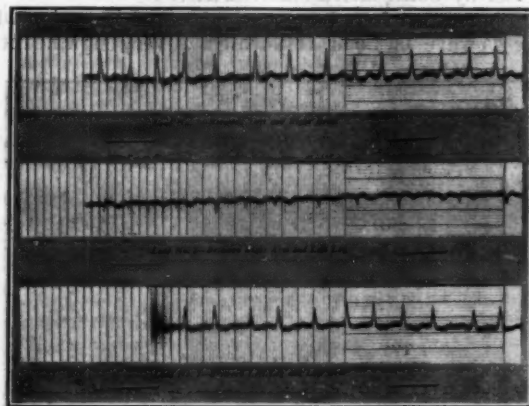


FIGURE X.
Auricular fibrillation. Ventricular rate, $145 \pm$ per minute.
Heart Block.

Clinical recognition of the milder forms of heart block is difficult, often impossible. This is especially true where the block is partial and of the type where there is delay in conduction through the auriculo-ventricular bundle, with consequent lengthening of the P-R interval of the electrocardiogram beyond the normal 0.20 second (Figure XI).

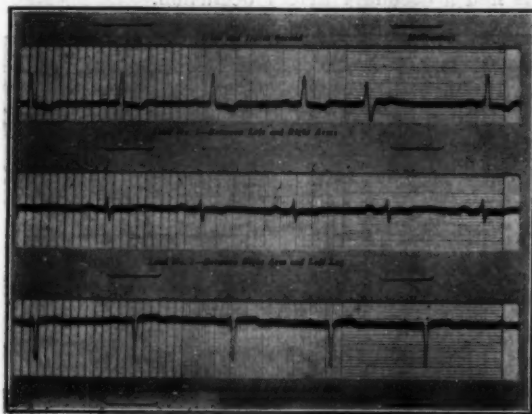


FIGURE XI.
Partial heart block. P-R interval = 0.24 second.

It should also be remembered that a complete heart block and partial (3:1) heart block may each have a ventricular rhythm of about 30 per minute, and also that a complete heart block, partial (2:1) heart block and simple bradycardia may occur when the heart rate is about 50 per minute (Figure XII).

Treatment.

The change in the electrocardiogram which may sometimes occur during the administration of

digitalis is one of the two instances in which the character of the change gives an indication as to its aetiology. The so-called digitalis T wave, whilst a reasonably constant phenomenon, may arise apart from digitalis medication, or fail to occur even though digitalis saturation is present. When present in its characteristic form, however, it is valuable evidence of digitalis intoxication, but reliance should not be placed on this electrocardiographic change alone in this connexion.

Serial records taken during the course of treatment of auricular flutter by quinidine are of value in so far as they will show the sequence of changes passed through prior to the restoration of normal rhythm.

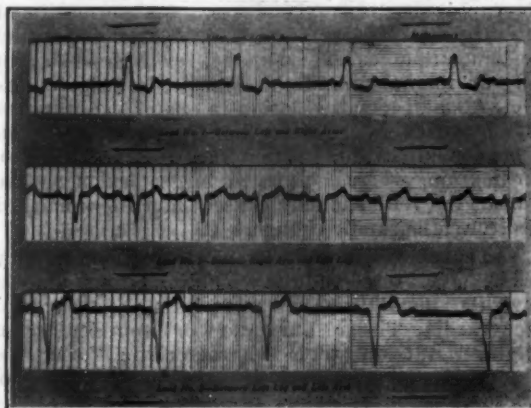


FIGURE XII.
Record showing 2:1 heart block in Leads I and III and normal rhythm in Lead II. (Right branch bundle block is also present.)

Coronary Artery Occlusion.

In no other condition is the value of an electrocardiogram so marked as in the case of coronary artery occlusion. Although the recognition of such a condition had been made clinically before the use of electrocardiography, the advent of the portable type of instrument and the fuller appreciation of certain pathognomonic changes greatly added to the accuracy of diagnosis.

In discussing the changes in the electrocardiogram which result from coronary artery occlusion, it is important to remember that, apart from the rare congenital type of bundle branch block and new growths of the heart, most, if not all, affections of the myocardium are vascular in origin. From the pathological standpoint, there are two types of coronary artery occlusion; the acute type associated with nodular atheroma of the affected vessel, and the chronic type ensuing on a more gradual narrowing of a vessel due to obliterative endarteritis. It is now well known that the coronary vessels are not end-arteries, and that, following occlusion, anastomoses take place which in course of time may lead to a more or less efficient blood supply to the affected area. The change in the electrocar-

diagram following coronary artery occlusion is not due to the actual mechanical stoppage of the blood flow in the vessel, but to the effect that this stoppage has on the nutrition of the myocardium which it supplies, so affecting its contractility and conduction.

A recent coronary artery occlusion produces changes in the electrocardiogram which are not only distinctive, but which will be found to vary with the subsidence of the myocardial damage. This is all the more significant because the electrocardiogram of a normal heart remains remarkably constant over long periods of time. On account of this, it is easily conceivable that the distinction between the acute and chronic types of coronary artery occlusion may often be aided by electrocardiographic studies. The degree of abnormality of the electrocardiogram, however, does not parallel the amount of cardiac damage, for it depends not only on the amount of the damage, but also on its site. A small localized lesion in one of the branches of the auriculo-ventricular bundle gives rise to an extensive alteration in the form of the electrocardiogram, whereas a much larger lesion in the wall of the ventricle may cause a much less marked electrocardiographic change.

Non-specific changes in the electrocardiogram may occur, *e.g.*, low voltage, bundle branch block, auricular fibrillation, extrasystoles and paroxysmal tachycardia, either auricular or ventricular in origin. But in their characteristic form the changes to be described are absolutely pathognomonic of coronary artery occlusion, and, so far as is known, do not occur in any other condition.

The typical change in the electrocardiogram following coronary artery occlusion of either the acute or chronic type is an alteration of the *RST* portion.

Soon after an acute occlusion has occurred, a deviation of the *R-T* period may take place, which may start either above or below the iso-electric level.

Leads I and III show the deviation best as a rule, and in these two leads the deviation will be in the opposite direction. If it is upwards in Lead I it will be downwards in Lead III; that is, an *R-T* elevation in Lead I will appear as an *S-T* depression in Lead III (Figure XIII).

Inversion of the *T* wave in Lead I probably corresponds to occlusion of the left anterior descending or to the posterior circumflex branch of the left coronary artery, and inversion of the *T* wave in Lead III to occlusion of the right coronary artery. At varying intervals of time after the occlusion, the electrocardiogram will show an inversion of the *T* wave in one or more leads, often sharply peaked, and showing an upward convexity of the *R-T* or *S-T* period. If this feature is found only in Lead III it cannot be considered pathognomonic, unless the *T* wave in Lead II is also inverted (Figure XIV).

This latter type of change is the one most likely to be found, as it is not always possible or prudent

to take an electrocardiogram immediately after an acute coronary artery thrombosis has occurred, and also because this type of curve is the one usually found as a result of chronic narrowing of a coronary vessel by obliterative endarteritis.

I have also found a certain type of inversion of the *T* wave in Lead III, which is very significant.

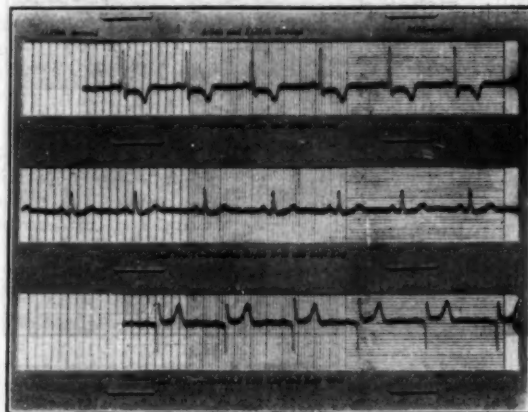


FIGURE XIII.

Record showing changes caused by a recent coronary artery occlusion.

The characteristic alteration of the iso-electric period of the ventricular complex between the *R-S* and *T* waves, and also in the *T* wave itself, may not occur in the electrocardiogram of every patient who has had a coronary artery occlusion.

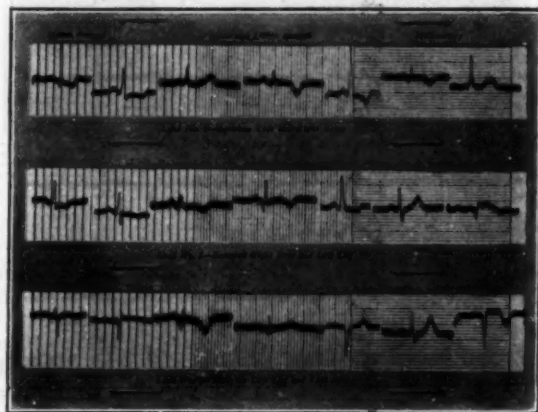


FIGURE XIV.

Complexes taken from seven cases of coronary artery occlusion, showing the variety of electrocardiographic changes found in this condition.

It is indeed unfortunate that in this condition, where an exact diagnosis is so imperative, in some cases the electrocardiogram appears to be at variance with undoubted clinical and *post mortem* findings; on the other hand there are times where many difficulties beset accurate clinical diagnosis; for example, in some cases of gall bladder disease

where electrocardiographic evidence may be most valuable.

It is certainly disconcerting to find a normal electrocardiogram in a patient who has undoubtedly had an acute coronary artery occlusion and one must be prepared at present to speak of the "silent areas" of the heart. Fortunately, such an occurrence is rare, and in a series of 650 electrocardiograms taken in private practice, and which includes 103 cases of coronary artery occlusion, I am aware of only four cases in which, despite definite clinical evidence of such a condition, an electrocardiogram was obtained which did not show the characteristic changes. On this ground alone critics of the electrocardiogram have deprecated its value, and it is comforting to hope that as a result of work by Wood and Wolferth, of which further mention will be made later, that by an alteration of technique, an electrocardiogram will eventually become as exact and indisputable in the diagnosis of this condition as is the case with the various disturbances of rhythm.

It must be recognized that the electrocardiographic changes following coronary artery occlusion are not the same in every case, in some cases this is due to the variation in the site of the occlusion, and in others to the fact that the record has been taken at a varying interval of time after the occlusion has occurred, and also as mentioned previously, there may be present either of the two common pathological causes of the occlusion (Figures XV and XVI).

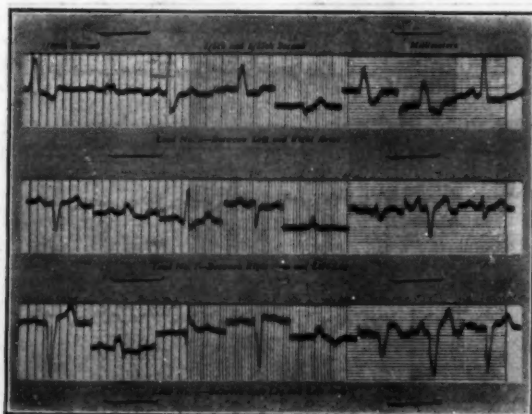


FIGURE XV.

Records taken from eight cases of coronary artery occlusion in which interference with the conducting mechanism occurred.

The electrocardiographic changes are evidence of fact and not of degree. Further, two very similar records do not necessarily denote the same prognosis; many clinical factors must also be taken into consideration.

While being conceded that an electrocardiogram is of the greatest value in the diagnosis of cases of coronary occlusion, presenting atypical symptoms, it may be asked of what value is such a

record when the clinical picture enables an exact diagnosis to be made.

The essential part of the treatment is rest for some considerable time, and the type of patient usually so affected is the active brain-worker with responsibilities who, during the latter stages of his

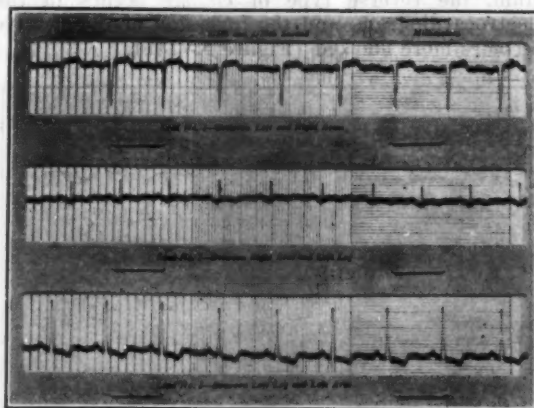


FIGURE XVI.

Record taken in a case of known dextrocardia. The appearance of the T waves is evidence of myocardial degeneration due to coronary artery occlusion.

enforced idleness, feels perfectly well and is free from all symptoms. If such a patient can be shown visual evidence of definite changes in myocardial structure he will probably be much more amenable to his idle state.

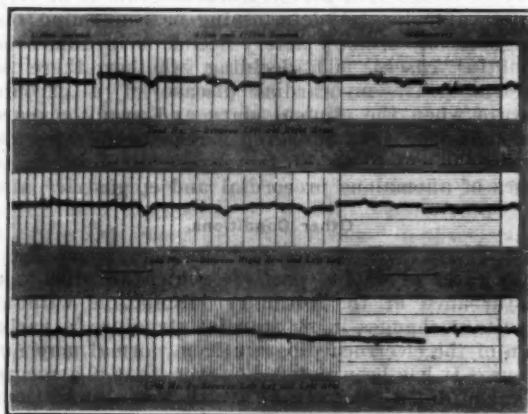


FIGURE XVII.

Progressive records in a case of coronary artery occlusion. The first was taken within forty-eight hours of an acute coronary artery thrombosis, the second record one week later, and the others at monthly intervals.

The progress of an acute occlusion may be followed by electrocardiographic records which, in conjunction with clinical signs and symptoms, give valuable evidence of the reparative progress (Figure XVII). As the myocardial infarct becomes organized, the changes of the T wave will gradually return to normal, till in many cases after

varying intervals of time a quite normal electrocardiogram may be obtained. In the type of case where the electrocardiographic changes are due to a more gradual narrowing of a coronary vessel, and where the anastomosis of the vessels is insufficient to provide an efficient blood supply to the myocardium, the reverse type of change occurs in the electrocardiogram, and the inversion of the *T* wave becomes more marked (Figure XVIII).

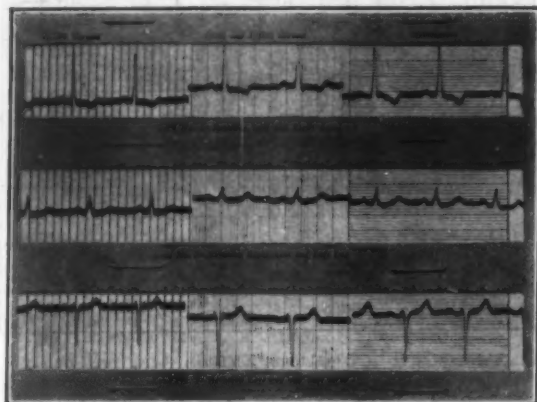


FIGURE XVIII.
Records in a case of chronic coronary artery occlusion, showing progressive deepening of the *T* wave in Lead I and increasing size in Lead III. (Approximately one year elapsed between records.)

The differential diagnosis of coronary artery occlusion is beyond the scope of this paper, but it may be stated that an electrocardiogram is of very great value in: (i) determining or confirming the diagnosis of coronary artery occlusion in numerous doubtful cases; (ii) deciding whether there is present grave myocardial disease of a chronic nature when the clinical signs and symptoms are inconclusive; (iii) affording a reasonable criterion as to the condition of the myocardium in many cases of anomalous precordial and epigastric pain.

Other Conditions.

Angina Pectoris.

In cases of *angina pectoris*, which are due to a disturbance of the coronary circulation without resultant changes in myocardial structure, a variation of the electrocardiogram from normal may not occur. It has been noted, however, that if a record is taken during the actual attack, some alterations of the *T* waves, such as flattening or inversion, are often found. This strengthens our belief that such alterations in the *T* wave are due to nutritional disturbances of the heart muscle, whether angiospastic or obstructive in origin.

In *angina* due to coronary artery disease, the distinctive changes would be such as have been already discussed.

Valvular Lesions.

It is obvious that an electrocardiogram cannot give direct evidence of the existence of valvular lesions. It is a well known fact, however, that

hypertrophy of the left ventricle is usually associated with aortic insufficiency and arterio-sclerosis, whereas right-sided hypertrophy accompanies congenital pulmonary lesions and mitral involvement. By showing either left or right ventricular preponderance, the electrocardiogram may draw attention to unrecognized valvular lesions as well as confirm an already made clinical diagnosis. This is important, as owing to the absence of a presystolic murmur in mitral stenosis when the auricles are fibrillating, the clinical recognition of the mitral lesion may not be made. In another instance, a patient may have a diastolic aortic murmur combined with a presystolic murmur at the apex of the heart—a combination which is not uncommon. The question arises whether the presystolic murmur is due to the condition described by Flint or whether an actual mitral stenosis exists. If a right-sided preponderance is shown by the electrocardiogram, the diagnosis of mitral stenosis can quite safely be made, whereas left ventricular preponderance points to aortic insufficiency.

One of the most important services of the electrocardiogram, as has been previously emphasized, is its ability to supply evidence as to the condition of the myocardium. In valvular lesions, it is well known that heart failure depends as much on the condition of the heart muscle, brought about by the same toxic or infectious agent that is responsible for the leak as on the dynamic changes produced by the leak itself. So that if, in cases of valvular heart disease, the electrocardiogram shows

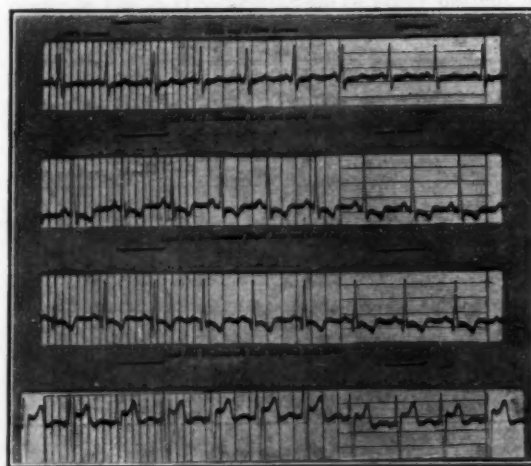


FIGURE XIX.
Record showing coronary artery occlusion in a patient with aortic regurgitation. Wassermann reaction positive. Blood pressure 140/35 millimetres of mercury.

a normal conduction time and there is no disturbance in rhythm or in the *QRS* or *T* groups, the myocardium may be considered practically uninjured, and the prognosis is good in this regard. If on the other hand there are changes in the electrocardiogram, there is definite evidence of myocardial involvement and the probability of an efficient compensation is less (Figure XIX).

Alternation of the Heart.

The electrocardiogram does not often show any abnormality in this condition, though Lewis has shown that when the condition is marked the *R* and *T* waves may vary in size.

Congestive Heart Disease.

The electrocardiogram may or may not be of assistance in this condition; the clinical picture, however, is usually so marked as not to necessitate further diagnostic assistance.

Changes as Yet Imperfectly Understood.

Low Voltage.

The causation of low voltage of the electrocardiogram, the standard of which is an excursion of not more than five millimetres either side of the base line, is imperfectly understood. It may be stated, however, that the occurrence of such a change in any one or combination of other leads, except in the case of all three leads, is not of special significance. In the latter instance, in cases showing definite evidence of cardio-vascular degeneration, the occurrence of such a record justifies a bad prognosis.

Changes in the *T* Wave in Lead III.

While it is recognized that inversion of the *T* wave in Lead III may occur in perfectly normal hearts, I have found that a sharply inverted *T* wave in Lead III with a convex *S-T* interval, with or without a sharply upright *T* wave in Lead I, is in some cases of marked significance. In several instances following a period of time, I have found such a record eventually to show the typical changes resulting from coronary artery occlusion, with inversion of the *T* wave in Lead II (Figures XX and XXI).

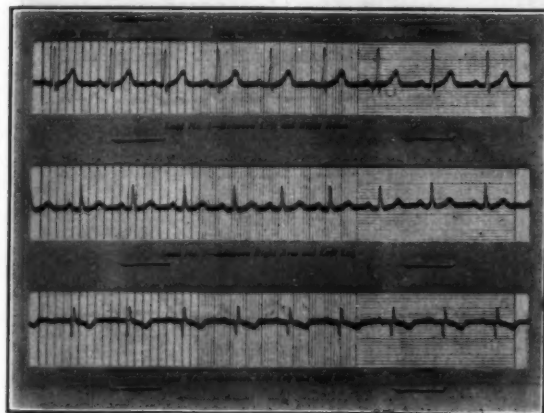


FIGURE XX.
Record showing inversion of the *T* wave in Lead III and sharply upright in Lead I. In view of the form of these waves it was suggested that a further record should be taken in three months.

In the recovery stage from an occlusion of the right coronary artery where the *S-T* interval has been at first elevated in Lead III and later the *T* waves in both leads II and III have become

inverted, it is often found that the *T* wave in Lead II eventually becomes upright, leaving a sharply inverted *T* wave in Lead III. One must therefore exclude the possibility, by means of a careful history, of an old myocardial infarction before an inverted *T* wave in Lead III may be dismissed as being of no significance.

It is hoped that further assistance in the correct interpretation of this *T* wave inversion in Lead III may be obtained by means of the fourth Lead.

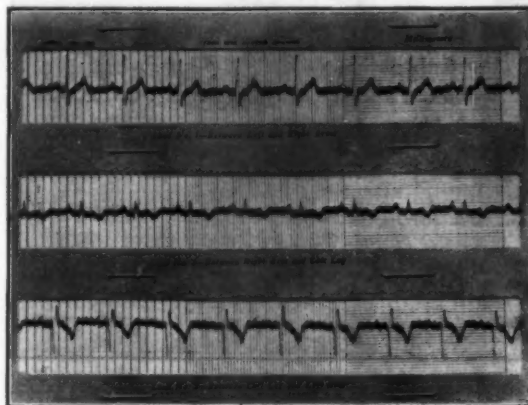


FIGURE XXI.

Same case as Figure XX three months later, now showing inversion of the *T* wave in Lead II. The appearances are now typical of coronary artery occlusion.

The Paths Along Which Further Research Work is Necessary.

When the universal three leads were adopted it was considered that they would fulfil all practical requirements. The more accurate clinical diagnosis of coronary artery occlusion in recent years, however, and recognition of the fact that a normal electrocardiogram may be obtained in a small proportion of these cases, led observers to experiment on artificial coronary occlusion in animals. It was found that occlusion of certain vessels did not produce any departure from normal in the electrocardiogram taken by means of the conventional leads, but that when leads were taken in an antero-posterior position as regards the chest wall, significant changes occurred. This experimental work by Wood and Wolferth⁽¹⁾ has led to the adoption of an antero-posterior lead in human beings, and papers have been published by them and by Hoffman and Delong⁽²⁾ on their observations.

The necessity for a standard position of the electrodes on the anterior and posterior aspects of the chest wall has been emphasized by Hoffman and Delong and a special type of electrode has been devised by them for this purpose.

It is hoped that by means of this fourth lead further valuable information will be obtained, not only in cases in which a normal electrocardiogram has been obtained by means of the conventional leads in a patient with definite clinical evidence of coronary artery occlusion, but also in certain cases

where the significance of an inverted *T* wave in Lead III may be in doubt.

From my own observations and those of the authors mentioned, it may be stated that the normal electrocardiogram obtained by means of the antero-posterior or fourth lead has the following character-

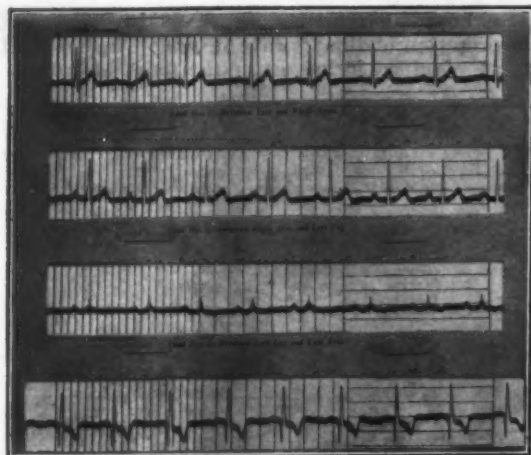


FIGURE XXII.

Normal electrocardiogram showing the appearance of a normal *T* wave in Lead IV.

istics: (i) The *P* wave may be upright or inverted. (ii) The voltage of the *QRS* group is usually greater than occurs in the other leads. (iii) The *T* wave is inverted (Figure XXII).

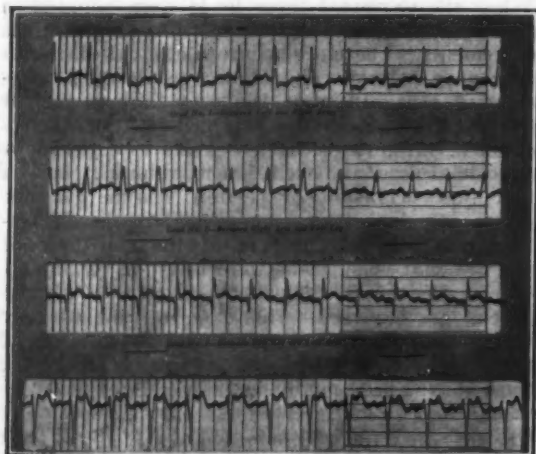


FIGURE XXIII.

Record showing the typical changes following acute coronary artery occlusion in the conventional three leads, with elevated *S-T* interval in Lead IV.

It would appear also that a disturbance of myocardial structure in certain positions would cause the *T* wave to become upright with an elevation of the *S-T* interval.

It has been found that in some cases of coronary occlusion the fourth lead is the only one showing

any abnormality, and in others that the fourth lead has been normal, while the other three show the well recognized pathognomonic changes, whilst again the changes may occur in all four leads. It remains, therefore, to stress the importance of the universal adoption of this lead, to correlate the

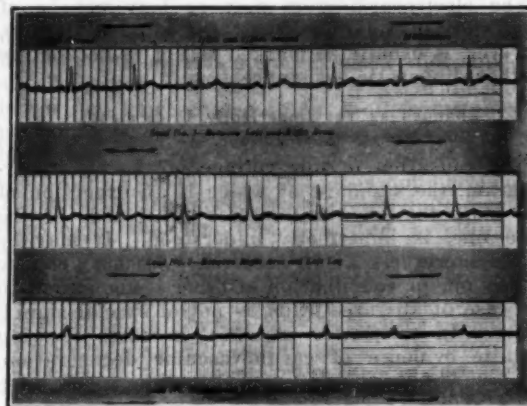


FIGURE XXIV.

Record in a case of undoubted acute coronary artery occlusion, taken about thirty-six hours after its occurrence. The record shows no abnormality.

electrocardiographic changes with the result of *post mortem* examinations and to obtain as large a number as possible of records from the fourth lead of normal hearts.

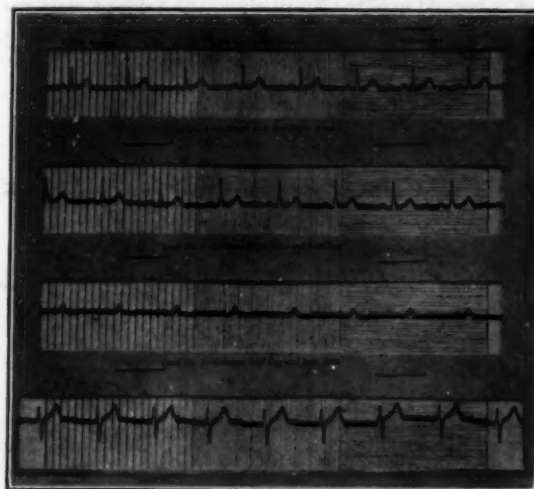


FIGURE XXV.

Same case as Figure XXIV. Record three months later: the *T* wave in Lead IV is sharply upright.

For some months I have been collecting such a series of normal and abnormal electrocardiograms taken by means of this fourth lead, and hope to publish the results of my observations in the near future. Figures XXIII, XXIV and XXV, however, will give an indication of the points above mentioned.

If, as would appear likely, the adoption of this antero-posterior lead will enable the electrocardiographic diagnosis of coronary artery occlusion to be made quite definitely in every case, it is not too much to hope that it will also lead to an accurate diagnosis of the coronary artery so affected, the determination of which may possibly aid in prognosis.

Summary.

1. The type of case in which electrocardiographic evidence may be of value has been described. 2. The importance of electrocardiographic aid in the diagnosis and prognosis of coronary artery occlusion has been stressed. 3. The necessity for further observations on the records obtained by means of an antero-posterior chest lead and their correlation with *post mortem* findings has been emphasized.

Acknowledgements.

To Dr. C. Bickerton Blackburn I am under a debt of gratitude for permission to use his case histories and electrocardiographic records. To Dr. Harold Ritchie I am also indebted for the above permission and also for the use of many books and articles on electrocardiographic studies, and much very helpful criticism and advice.

Dr. Allan Walker has not only given me much helpful criticism and advice but has also corrected the proofs; I am much indebted to him for his assistance in many ways. I should also like to thank Miss Jones, of Sydney Hospital, for much invaluable technical assistance.

References.

- ¹ F. C. Wood and C. C. Wolfarth: "Experimental Coronary Occlusion", *Archives of Internal Medicine*, Volume LI, May, 1933, page 171.
- ² A. M. Hoffman and E. Delong: "Standardisation of Chest Leads and their Value in Coronary Occlusion", *Archives of Internal Medicine*, Volume LI, June, 1933, page 947.

Reports of Cases.

TWO CASES OF "ACTINOMYCOSIS" TREATED BY RADIUM.

By SYLVIA BRAY, M.B., B.S. (Sydney),
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Case I.

W.J.O., a male, aged forty-six years, stated that in February, 1931, he noticed a painless swelling on the right cheek, over the jaw. This swelling remained in the same state for about three months, then an abscess slowly formed. A diagnosis of root abscess was made and the second and third molar teeth were removed from that side.

As no improvement of the swelling took place, the area was excised. It did not heal and commenced to spread upwards on the cheek, and numerous "yellow spots" appeared all over its surface. In June, 1931, the pus was examined and streptothrix colonies were found.

The patient had been doing pick and shovel work in Sydney for about twelve years, and before that time he had been working on the South Coast for a butcher for about ten years off and on; this work was slaughtering, skinning and dressing cattle, sheep and pigs. The patient said that at that time he had been in the habit of chewing grass stalks frequently.

In the last twelve years he had not handled any animals at all. He was a moderate beer drinker, smoked cigarettes, using two ounces of tobacco per week, and gave no history of venereal disease. His father had died of asthma at the age of forty-five years or thereabout, and at the same age his mother died of cancer of the breast. One brother died of "galloping consumption", aged twenty-two.

In June, 1931, there was a typical actinomycosis lesion about 5.0 centimetres (two inches) long and 2.5 centimetres (one inch) wide on the right cheek, midway between the symphysis and angle of the mandible. It was purplish red, slightly raised and nodular, and had five or six little pustules scattered over the surface. The Wassermann test gave no reaction and X ray examination of the chest revealed no abnormality.

On June 11, 1931, he was put on to massive doses of saturated solution of potassium iodide, 3.6 cubic centimetres (sixty minims) per day, and had distance radium applied. Four two-milligramme needles of unit strength and four three-milligramme needles of triple strength, with a screen of half a millimetre of platinum, were applied at a distance of 2.5 centimetres (one inch). Two and a half centimetres of wax and two thicknesses of lint were between the radium and the skin (a screen of lead two millimetres thick shielded the tissue surrounding the lesion). The duration of the application was ten days; the dose was 4,800 milligramme-hours.

The radium was placed so that the two-milligramme needles were surrounding the edge of the lesion and the three-milligramme needles were across the centre.

At the end of ten days, when the radium was removed, there was a good skin reaction, with a third degree erythema. On July 7, 1931, the reaction was at its maximum and the area had not altered much in appearance. One month later there was still a small area with three pustules on it (in the pus of which no colonies were found). The lesion had completely healed by the middle of October and has remained healed ever since.

The patient was last seen in April, 1933, when the excision scar was the only noticeable abnormality on the right cheek.

Case II.

M.S., a female, aged forty-one years, was first seen in June, 1932, when she complained of having had a small purplish red swelling the size of a sixpenny piece, which appeared on her left cheek, over the jaw, early in December, 1931. This lasted for one week, was quite painless and then subsided. In February, 1932, the same area again became swollen and this time she noticed a swelling on the corresponding part inside the cheek. This was probed and her medical attendant told her there was pus in the buccal swelling.

After this the spot settled down a little, but in April, 1932, it came up like an abscess and broke down, discharging pus and continued discharging after "Antiphlogistine" poulticing for several weeks.

In the past the patient had had pleurisy at the age of nine and a "gastric ulcer" nine years ago. She had kept a cow for the past four years and used to milk it occasionally herself, but had not noticed any sores on the animal at any time. She also kept and bred cats and pomeranian dogs. She had never been in the habit of chewing grass. There was nothing relevant in the family history.

The Wassermann test gave no reaction and chest skiagrams were also devoid of abnormality.

On examination there was seen a raised, purplish red, fluctuant area the size of a shilling piece, on the left cheek, midway between the symphysis and the angle of the mandible and about 1.25 centimetres (half an inch) above the margin of the jaw. This lesion was fixed to the deeper structures. About two cubic centimetres (half a drachm) of pus were evacuated from the area and streptothrix colonies were found.

On June 20, 1932, distance radium was applied, four three-milligramme needles (triple strength) and six two-milligramme needles (unit strength), with one-half

millimetre of platinum screenage, being used at a distance of 2.5 centimetres (one inch) of wax, the needles being arranged in a similar manner to that of the first case. The area surrounding the lesion was screened by one and a half millimetres of lead, and two thicknesses of lint were placed between the mould and the skin.

The duration of the exposure was 188 hours, the dose being 3,512 milligramme-hours. At the same time the patient was given a dosage of saturated solution of potassium iodide, 1.8 cubic centimetres (thirty minims) per day. At the end of July she was taking 7.2 grammes (120 grains) of potassium iodide per day, and she continued with this dose for a fortnight and then took no more. In September, 1932, she had a septic tooth stump removed from the second left lower molar area.

Her progress was exactly similar to that of the first patient, except that her primary radium reaction was comparatively mild, being only an erythema of the first degree on the removal of the radium. At the end of October, 1932, the lesion was quite healed and has remained healed ever since.

Comment.

It is difficult to say whether the cure of the two patients was due to the radium alone, the iodide alone, or to the radium acting in conjunction with the iodide.

It would be interesting to learn if anyone has treated any cases by means of radium alone, and to compare notes on the course of the disease when treated by the two methods separately and combined.

The late Dr. George Hamilton intended to report these two cases, but was prevented from doing so by his untimely death.

Reviews.

PHYSICAL THERAPY.

A SECOND edition of "Physical Therapeutic Technic" appearing within three years of the first, is evidence of a definite demand for this book.¹ This edition has been revised by W. D. McFee, Dr. F. B. Granger having died since the first edition was published. The main addition is a chapter on diseases of the ear, nose and throat, including details of the method of removal of the tonsils by electro-coagulation. Written especially for the general practitioner, the book contains the general principles of the various physical methods, while the treatment of the various diseases by such means are given in detail and set out in a suitable manner for quick reference. As in the previous edition the chief objection is that in many of the conditions dealt with, physical therapy would be of little or no value. The exclusion of such diseases as diabetes, eye strain, duodenal ulcer and many others would add value to the book.

CALCIUM IN METABOLISM AND TREATMENT.

A. CANTAROW's book, "Calcium Metabolism and Calcium Therapy", is a critical summary of the progress of knowledge and opinion in the subject.² Knowledge of the metabolism of calcium has made great progress in the last twenty years. It is in these years that the calcium-influencing vitamin or vitamins have been recognized, the importance of the parathyroids established, even if not yet fully under-

¹ "Physical Therapeutic Technic", by F. B. Granger, A.B., M.D.; Second Edition, revised by W. D. McFee, M.D.; 1932. Philadelphia and London: W. B. Saunders Company; Melbourne, Brisbane and Christchurch: James Little and Son. Royal 8vo., pp. 426, with illustrations.

² "Calcium Metabolism and Calcium Therapy", by A. Cantarow, M.D., with foreword by H. A. Hare, B.Sc., M.D., LL.D.; Second Edition; 1933. Philadelphia: Lea and Febiger. Demy 8vo., pp. 264. Price: \$2.50 net.

stood, and the parathyroid hormone has been discovered. So fast is the growth of investigation, of speculation and of knowledge itself, that it is very hard indeed to keep pace with it. We owe a debt of thanks to the author of this little book for his summary. Only those who have been in close touch with the flood of original papers poured out in the past few years can have any conception of the greatness of the task essayed. A book of this kind, and on this subject, requires a thinking and intelligent reader, for metabolism is a difficult subject. Yet neither physician nor surgeon can pass it by.

The first chapters deal with the normal calcium requirement of the body, and the factors governing its excretion. Then come chapters on the blood calcium, the influences modifying its state and concentration, and on the functions of calcium in the economy of the body.

The author states fairly the views of others on disputed matters, and then gives his own opinion. Following this come chapters in which are traced the important developments which have followed the isolation of the parathyroid hormone. Some of this material is still very mixed and uncertain, but there is much real progress. Then the metabolic relations between calcium and disease are reviewed. Here, too, we can see a little more than we did, but much is still very uncertain. The third part of the book deals with calcium therapy. To the clinical practitioner, whether physician or surgeon, this is the part that tells the most, for it shows the way to the practical application of this very recent knowledge. The surgeon will be told that the common practice of giving calcium salts in cases of fracture is a futile proceeding. The physician will be told that there is a reasonable hope of overcoming the tendency to dental caries. The surgeon and the anaesthetist will be told to think of modern forms of calcium therapy before subjecting certain patients with gall-bladder conditions to ether anaesthesia.

ACIDOSIS AND ALKALOSIS.

To the modern physician a knowledge of the biochemical aspects of acidosis has become essential. Some of the questions involved are highly technical and beyond the apprehension of those not specially trained in biological chemistry. In their small book on acidosis and alkalosis, Graham and Morris have made an excellent contribution to the clinical aspect of this subject and have given a judicious selection of those features which have an interest to the physician.³

In the opening chapters are discussed the more theoretical problems and this knowledge is later applied to a consideration of various clinical conditions associated with diabetes, nephritis, gastro-enteritis, cyclical vomiting, salicylate poisoning, anaesthesia, tetany, and pyloric stenosis. Most of the observations have been made on children and while it is true that changes in the acid-base equilibrium are more likely to occur in childhood, it would be a decided advantage to have included in this volume the results of more investigations in adults. In discussing the treatment of cyclical vomiting the authors suggest that glucose be given *per rectum*. There is considerable clinical and laboratory evidence to indicate that glucose is absorbed very poorly, if at all, from the colon and it is unwise to place faith in such a therapeutic measure when research has shown its probable futility. The book contains many useful graphs and tables which illuminate the text and also has three appendices, the first of which illustrates the ketogenic-antiketogenic value of foods, the second describes the preparation of solutions used in the treatment of acidosis and the third discusses molar and normal solutions. A short list of references concludes a well written and valuable little book.

³ "Acidosis and Alkalosis", by S. Graham, M.D., F.R.F.P.S., and N. Morris, M.D., B.Sc., D.P.H., F.R.F.P.S.; 1933. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 215, with illustrations. Price: 7s. 6d. net.

The Medical Journal of Australia

SATURDAY, NOVEMBER 18, 1933.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

Reference to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE HOBART CONGRESS.

THE date of the Hobart congress is drawing near and, strange as it may seem, some members of the British Medical Association do not seem to realize that a congress is to be held. Others, maybe, knowing that the congress is to take place, have not seriously asked themselves whether they should and could attend. The time has come when every member of every Branch in Australia should ask himself or herself this question.

The title Australasian Medical Congress (British Medical Association) though cumbersome, serves to remind members of the Branches that the congress is part of the organization of their Association. Although congresses have been held in Australia and New Zealand for many years, the forthcoming session will be but the fourth since the control of the congresses was taken over by the British Medical Association. There can be no doubt that the control of congresses by the Federal Council of the British Medical Association in Australia is to the advantage of the Branches and their members. The Association in Australia has recently made a forward move by substituting the Federal Council for the Federal Committee. The members

of the Branches should see to it that the first congress held under the ægis of the Federal Council is a success. The Tasmanian Branch is the smallest Branch in Australia; it issued an invitation to the Federal Council to hold the congress in Hobart at a time when it seemed as though the fourth session would lapse until after the annual meeting of the Association in Melbourne in 1935; it prevented a hiatus that would have been more than unfortunate. If the Tasmanian Branch was sufficiently enthusiastic and public spirited to shoulder such an undertaking in such distressful times and when so little time was left for preparation, it is surely the duty and the privilege of the other Branches to do their share and to justify the Tasmanian optimism.

The comprehensive programme and the attractive surroundings in which the meeting will be held should be sufficient to insure a good attendance. The draft programme was published in the issue of October 28, 1933. The two plenary sessions will be of the greatest interest, for every medical practitioner is concerned with the treatment of cancer and therefore with what is being done in cancer research, and, similarly, every practitioner has a personal interest in the hospital problems of Australia. The eleven sections have been carefully organized and some important papers have been promised. The place of meeting is most suitable for the hot weather of January, and visitors from the other States will receive a most cordial welcome from the members of the Tasmanian Branch. They will find the climate of Hobart delightful and its surroundings full of historic interest. For the benefit of those who do not know Tasmania, we publish in this issue an account of Hobart and its surroundings, with some views that will, we hope, bring wavering members of the Branches to a prompt decision to spend a profitable holiday at the congress. We take this opportunity also of thanking Messrs. Allen and Hanburys, Limited, for their generosity in donating the space on the cover of this issue to the congress executive and for their good wishes that accompanied the gift.

In previous issues we have emphasized the importance of booking accommodation in advance. The executive wishes it to be known that first class

accommodation is still available. The attention of readers is directed to a notice regarding accommodation that appears in another place in this issue. Intending members are asked to communicate with Dr. E. A. Rogers, 135, Macquarie Street, Hobart, who will be glad to give any information regarding accommodation, motor car facilities and so forth. Those who are unable to attend the session and who have the welfare of the Association at heart are reminded that they may become members and will receive a copy of the Transactions on the payment of two guineas. Finally, the Executive Committee of Congress appeals to every one who has become a member to become a propagandist among his friends and to induce them to follow his example.

Current Comment.

HYPERINSULINISM.

SINCE the introduction of insulin into practical medicine a keener interest has been taken in studies of the variations found in the level of glucose in the blood. The precautions that must be observed when insulin is administered have drawn attention to the symptoms that arise when the glucose level falls below a figure which appears to be more or less peculiar to the individual. This critical level of blood glucose is not unalterable. Familiar are the changes in it that occur when a person becomes a diabetic, and significant, too, are the curious fluctuations both of this and of the renal threshold observed during an attack of diabetic coma. But latterly it has been recognized that a raising of the blood sugar above what is recognized as being the normal limits is not the only abnormality in the blood sugar content of the body. A lowered blood sugar content is recognized as a clinical entity. A few cases have been found to belong to the interesting group that includes examples of over-function of a ductless gland due to the presence of a neoplasm. Just as an adenoma of the parathyroid gland may cause very serious disturbances of the calcium balance and of the osseous system so an adenoma of the islet tissue of the pancreas can cause a more or less serious condition of hypoglycæmia.

Eugene Ziskind describes an interesting case of so-called "spontaneous" hypoglycæmia with some unusual features.¹ The patient was a young man who was admitted to hospital in a state of coma.

For eighteen months prior to his admission he had suffered from attacks of weakness, headache, trembling and mental confusion occurring about noon. The taking of food relieved these sensations, but for some months he had been unable to engage in any athletic exercises on account of the extreme and uncomfortable feelings of weakness engendered thereby. When admitted to hospital he was found to be paralysed on the right side of the body. The deep reflexes were increased on this side, and an extensor plantar reflex was constantly present on the right side and inconstantly on the left. No abnormal finding was made in the spinal fluid, and the only variation from normal in the blood chemistry was an unduly low level in the dextrose it contained: this was only 58 milligrammes per hundred cubic centimetres. The administration of glucose soon improved the patient's condition, but it was found that considerable amounts of glucose were required to keep his blood sugar above the hypoglycæmic level. But even when this end was gained (by the six-hourly injection of as much as 350 cubic centimetres of 10% dextrose solution) it was found that he was aphasic and the hemiparesis remained. High carbohydrate feedings were given and the patient was encouraged to indulge his now voracious appetite; the neurological signs gradually improved. It was two months before the neurological signs were satisfactorily improved, but the visual fields were found to be restricted for nearly a year, when the right homonymous hemianopia that was present with the original hemiparesis finally disappeared. A diagnosis of a vascular lesion in the brain was made; its site was assumed to be in the region of the angular gyrus; its nature a thrombosis; its cause was thought to be definitely related to the hypoglycæmia. Though the young man made a satisfactory recovery, he did not lose the tendency to exhibit uncomfortable or even dangerous reactions due to an abnormally low blood sugar. On several occasions he had convulsions due to the omission, accidental or otherwise, of his usual adequate carbohydrate ration. Accordingly laparotomy was performed in the hope that a tumour of the islet tissue of the pancreas might be found. Nothing of the nature was discovered, however, and an attempt was made to remove portion of the pancreas. Technical difficulties prevented the removal of an adequate amount of the gland, and the condition of the patient remained unchanged. The administration of thyroid substance was tried, also daily injections of anterior pituitary gland extract, but no improvement followed. The tendency to exhibit severe hypoglycæmic reactions still remains, but the patient can be kept comfortable and well, provided he consumes a large ration of food with a very liberal and unrestricted carbohydrate intake.

Transient cerebral symptoms are common with hypoglycæmic crises, but the duration of the neurological disturbances of this person are fortunately

¹ Archives of Internal Medicine, July, 1933.

of a degree most unusual. Of interest, too, is the fact that the defect was apparently an essential one, that is, not due to an added factor, such as a glandular neoplasm. The nature of the defect is not quite clear. The ordinary glucose tolerance test revealed an apparent decrease in tolerance, but the more accurate intravenous test, which eliminates absorption difficulties, showed an increase in dextrose tolerance. The author assumes, as the title of his article shows, that the condition was due to an excess of insulin production. This seems reasonable, but as the exact mechanism concerned in the action of insulin cannot be said to be known with certainty as yet, the last word has perhaps not been said. But this severe and dangerous type of essential hypoglycæmia also serves to direct our attention to lesser grades of the same syndrome, and it will be remembered that Sippe and Bostock have described in this journal various types of chronic hypoglycæmia. Of all directions in which knowledge on this subject can grow, possibly the most encouraging is that which runs parallel with advances in the endocrines, but this must be left to the future. Recognition of at least the more severe and dramatic forms of hypoglycæmia should, however, fall within the scope of all.

GONOCOCCAL ENDOCARDITIS.

THE gonococcus belongs to a group of micro-organisms to which man possesses a partial immunity. The *Micrococcus catarrhalis* appears to be most usually a secondary invader of the respiratory tract and does not appear to have a high degree of pathogenicity. The meningococcus owes its sinister reputation to its most unfortunate choice of habitat. It may exist in the nasopharynx without serious effect; it may cause a septicæmia from which recovery is common. But in the meninges serious mischief may arise from a lesion that might easily be overcome elsewhere. Similarly the gonococcus, though the cause of untold troubles in the urethra and adnexa, the pelvis, the joints and a possible serious invader of the conjunctiva and the endocardium, is not highly virulent on the whole, when compared with other pyogenic bacteria. But though, for example, wound infection by this organism is not common, it is possible, and at least one member of the medical profession has perished thus through a finger pricked during the course of an operation. Gonococcal endocarditis is naturally a very serious disease, though P. Solomon, D. Hurwitz, M. Woodall and M. E. Lamb, in presenting a complete study of one case, have collected only forty-eight cases recorded in the literature since 1912.¹

Some of the recorded cases are very incomplete, lacking bacteriological confirmation. There is

perhaps not a great deal to be added to what was known when some of the earlier series were published, such as that of Thayer. But it is always advantageous to study a complete and accurate report of even a single case of a rather uncommon malady.

These authors grew the organism from the blood stream and also from the endocardial vegetations found *post mortem*; it proved to fulfil all the requirements of bacteriological identification. The patient studied was a negress, aged twenty, who, after a normal delivery of a full-term child, was observed to be febrile on the third day. There were a few moist signs at the base of one lung, and a little later a murmur was detected in the mitral area. Blood-stained sputum appeared, apparently due to infarction of the lung; for a week later, after a rigor, complete hemiplegia suddenly occurred. These signs of embolism suggested the diagnosis of bacterial endocarditis; this was confirmed by the finding of a leucocytosis of 15,000 and of a Gram-negative diplococcus on blood culture. Clinical study suggested that the valvular lesion was aortic in situation. The patient died after a brief terminal attack of pulmonary oedema, and autopsy revealed an acute vegetative endocarditis of the aortic valve with evidence of embolism in the spleen, the lungs and brain. Chronic endocervicitis was also found.

The review of the literature and analysis of the cases reported therein show that very complete evidence is necessary before it can be said that gonococcal endocarditis exists in any given case. On the one hand, an endocarditis even of septic type may be proved, but this may not be gonococcal in spite of the presence of other lesions of this nature. On the other hand, gonococci may be isolated from the blood stream during acute exacerbations of arthritis *et cetera*, but there may be no evidence of any cardiac involvement. In this connexion mention should be made of the work of Tebbutt, whose publication in this journal is referred to by the writers. Treatment remains an unsolved problem, though the appropriate antiserum would seem worthy of trial. But even as it appears reasonable to suppose that recovery does take place at times from a streptococcal endocarditis, so it is not impossible that lesser grades of the gonococcal variety are occasionally recoverable. A study of reported cases gives us a little hope in this direction, though the evidence is very slender. Any patient whose illness suggests the possibility of this form of cardiac infection should be investigated as fully as possible, for if diagnosis is to be accurate, it must rest on a sure foundation, and if treatment is not always to be futile, it must be instituted early. From the standpoint of preventive medicine mention only needs to be made of the fact that in the particular case here studied the illness arose through the presence of an active, though apparently unsuspected, gonococcal lesion during pregnancy.

¹ Archives of Internal Medicine, July, 1933.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Vitamin A Metabolism and Susceptibility to Diphtheria Toxin.

C. C. TORRANCE (*The American Journal of Hygiene*, September, 1933) points out that it has been shown that animals depleted of vitamin A become more susceptible to bacterial infections and other noxious influences. Experiments designed to decrease the susceptibility of such agents by increasing the intake of vitamin A have yielded varying results. The author has fed increased amounts of vitamin A to guinea-pigs and has found that the survival time after the injection of diphtheria toxin was not increased. Vitamin assay of the livers of the animals showed that their vitamin A stores had not been increased by giving them cod liver oil. Regardless of the diets on which the animals had been raised, it was found that there was a high degree of correlation between the survival time of the guinea-pigs and the amount of vitamin A stored in their livers, but that no such relation existed between this amount and the vitamin A taken into the body, except in regard to those animals fed on a diet free from vitamin A and the guinea-pigs raised on rations containing fresh grass.

Typhoid Carriers and Gall-Bladder Operations.

HERMAN F. SENFTNER and FRANK E. COUGHLIN (*American Journal of Hygiene*, May, 1933) report their observations on typhoid carriers in New York State (exclusive of New York City). Typhoid fever mortality has decreased in this area from 19.7 per one hundred thousand of population in 1908 to 1.0 in 1931. This decrease is attributed to improvement in water supply, construction of sewage disposal systems, and better control of milk supplies. Between 1911 and 1932, 368 chronic typhoid carriers have been discovered, exclusive of 59 in New York State institutions. Seventy-two of the carriers were discovered through the routine examination of specimens after attacks of typhoid fever; 277 during investigations of outbreaks or sporadic cases of typhoid, 4 by routine examination of food handlers, and 15 accidentally, of whom 6 were discovered following gall-bladder operations. Of those discovered by means other than release cultures, 20.9% denied a previous attack of typhoid fever; 89, or 39.2%, had had an attack more than twenty years before discovery as a carrier. One hundred and sixty-one, or 43.8%, were housewives, 45 were dairy workers, 53 were food handlers other than housewives, and 9 were nurses. Since 1929 at least two "negative" faecal specimens, taken not less than five days apart, have been required for release of

typhoid fever patients whose occupation did not involve food handling; with food handlers four "negative" faecal and four "negative" urine specimens were required. Between 1920 and 1932, 68 typhoid carriers have had their gall-bladders operated on, and of these 16 were in State institutions. In 61 the gall-bladder was removed and in 7 drained. Of the 68, 42 were operated on for the relief of the carrier condition primarily, 26 were operated on for the relief of symptoms primarily and incidentally because of their carrier condition. Removal of the gall-bladder resulted in the apparent cure of 59%. The mortality of the 68 persons operated on was 14.7%; if those in State institutions and those in whom acute symptoms indicated operation are excluded, the mortality rate was 3.7%. Sixty-eight per centum of those who survived operation were apparently cured. The authors conclude that removal of the gall-bladder for cure of chronic typhoid carriers should be advised only after careful consideration of the physical condition and age of the carrier, and only if duodenal specimens are proved to contain *Bacillus typhosus*.

An Anaerobic Gram-Negative Bacillus Causing Pyæmia.

A. W. FRANKLIN (*The Lancet*, September 16, 1933) reviews the literature and reports two cases showing that members of the fusiformis group, either alone or in combination, can produce both local abscesses and general blood stream infection. The first patient, a young woman, aged eighteen years, suffered from suppurative otitis media and was operated on. The second patient, a girl of five years, also had a mastoid infection and was operated on. The infecting organism was isolated in pure culture from the blood of both patients during life; it was found in the pus in the skull in the first case, and in the second case in pus from a gum abscess, the pleural cavity and the urine. The organism was a Gram-negative, pleomorphic bacillus, occurring in films of pus in pairs and long chains, resembling in parts a Gram-negative streptococcus, in others *Bacillus influenzae*. In films of cultures longer and stouter bacillary forms were seen, but no fusiform bacilli and no spirochaetes. The length of single bacilli varied from 0.8 μ to 9.5 μ . They were non-motile and non-sporing.

Species Immunity to Virulent Streptococci.

H. B. DAY (*The Journal of Pathology and Bacteriology*, September, 1933) has undertaken a study to investigate the possible immunizing property of a type-specific antigen extracted from streptococci. The method found by him to be most simple was simple heating in one-twentieth normal solution of hydrochloric acid at 60° or 80° C. for forty-five minutes. Extracts were cleared and neutralized and injected into

rabbits. He summarizes his findings by stating that when their virulence is exalted streptococci become resistant to phagocytosis and to extraction with acid. Their agglutination reactions with antisera are also modified. These properties of virulent streptococci appear to the author to be due to their power of forming a special material that is antigenic. This special antigen is common to the species and is formed by streptococci of different types—hemolytic and non-hemolytic. In broth cultures this antigen is formed only by highly virulent strains during the phase of active growth and is almost entirely attached to the cocci. In serum-broth cultures this antigen is also present in the culture fluid and persists longer. This species or "V" antigen resembles other antigens of pyogenic cocci in being: (i) resistant to acid, (ii) destroyed on heating in an alkaline medium, (iii) destroyed by exposure to the action of bacterial enzymes, (iv) readily adsorbed to protein on precipitation of the protein. Injection of "V" antigen excites active immunity to all virulent streptococci, hemolytic and non-hemolytic, while the serum of animals not treated confers passive immunity.

Filtrable Virus Carriers.

C. S. GIBBS (*The Journal of Infectious Diseases*, September-October, 1933) reports the identification of filtrable virus carriers in hog cholera, rinderpest and infectious laryngotracheitis of poultry. Lesions were taken from infected animals, a filtrate was prepared and injected into test animals. The author gives details of his observations and discusses the question of the control of these diseases. He claims that this is the first occasion on which filtrable virus carriers have been identified by a priori laboratory tests.

HYGIENE.

Relationship between Health Officer and Nurse.

J. C. GEIGER (*American Journal of Public Health*, July, 1933) states that in the United States today sixteen universities or schools of recognized standing offer courses to graduate nurses in public health nursing. Practical academic training in a recognized school is regarded as essential rather than simple reliance on the "school of experience". A bureau of child hygiene or a bureau of tuberculosis control is inconceivable without the public health nurse. Through the public health nurse the medical officer of health registers every individual in the community.

Immunization against Diphtheria.

W. P. SHEPARD (*American Journal of Public Health*, June, 1933) writes that in sampling 6,245 western children investigated by a life insurance company it was found that 24% had been immunized against diphtheria. Of the

1,496 immunized, 60% had been treated in the school clinics, 26.3% by private physicians, 13.3% by other public clinics, and 0.4% by the industrial physician. Of the 1,958 families which were not immunized, it was found that 70% of the reasons could be attributed to lethargy or ignorance, 22% to opposition, 7% to economic reasons, and 1% to legitimate medical reasons.

Frozen Vegetables.

R. P. STRAKA AND L. H. JAMES (*American Journal of Public Health*, July, 1933) report that hand-shelled peas were frozen in sixteen ounce commercial glass jars and inoculated with dried spores of *Clostridium botulinum* (Type A and Type B), some with less than 100 spores, others with 100,000,000 spores. A series of controls not inoculated was included. The temperature in the ice box used for defrosting and holding some of the jars ranged between 10.0° and 15.5° C. (50° and 60° F.). Toxin was obtained only in the defrosted samples of peas that had been held at room temperature, and all of these were definitely spoiled. No toxin was obtainable from containers defrosted and examined immediately or from containers defrosted and held in an ordinary ice chest. Toxic samples were obtained in peas that had been blanched in hot water, as well as in those that had been washed in cold water only.

Bacteria and the Nutrition of Mosquito Larvae.

E. H. HINMAN (*American Journal of Hygiene*, July, 1933) discusses the role of bacteria and the nutrition of mosquito larvae. In his investigations the common types of mosquito genera, Culicid larvae of *Culex*, *Aedes* and *Anopheles* were used, but chiefly *Aedes*. The eggs, containers, media *et cetera*, were all disinfected. *Culex* larvae can be killed by excessive growth of bacteria, for example, *Bacillus coli*, *Staphylococcus albus* or *Pseudomonas* in bouillon cultures. In sterile cultures larvae failed to metamorphose. When bacteria were inoculated into pond water the larvae grew well. Autoclaving this water rendered it unsuitable for larval growth. Autoclaving apparently destroys the growth-stimulating factor. Larvae from disinfected eggs failed to mature in sterilized inoculated media, but moderate amounts of bacteria stimulated growth. This growth-stimulating substance is destroyed by autoclaving and is non-filtrable.

Milk and Progress of Under-Nourished School Children.

F. E. LIVINGER (*American Journal of Public Health*, June, 1933) records a study of the records of progress in special health classes in Philadelphia for two years. In these classes pupils who were 13% or more underweight according to the Baldwin-Wood standards of age, height and weight, were enrolled. The consumption of milk ranged from nil to more than one quart daily. An extensive health

record has been maintained, including the financial status of the family, quality of home food, presence of physical defects *et cetera*. There were 163 health classes conducted by the nurses, each child spending four to five months in the class. In classes held in the autumn a greater increase of weight was recorded than in the spring. Records of 4,133 persons were sorted into five groups, based on differences in milk consumption. The average gain of those using milk at home and at school was 29% to 34% greater than of those using no milk. For the two years the average gain per pupil receiving no milk was 2.73 pounds per semester. Of the 3,865 users of milk in varying amounts, the average gain per pupil was 3.53 pounds per semester. Pupils using milk at home and at school gained 45% more than those not using milk. The gain for milk consumption was proportionately greater, allowing for age, as the pupils concerned were younger than those not receiving milk. One hundred and eighty-four pupils who received one quart or more of milk daily made an average semester gain of 4.34 pounds per pupil—the highest figure obtained. The differences recorded in groups according to physical defects or to family finances showed no significant relationship to gains in weight. Sufficient milk is found to be more essential for children with poor home food than for those where plenty of food of variety is available. The less well balanced the diet, the more the need for milk. Adequate rest periods at home in children receiving the same amount of milk added to the gain of weight. A higher percentage of those who received milk at school were reported to have improved in scholarship than was found for the other groups. The experience confirms the work of Leighton, Gerald and McKinlay, of the Department of Health for Scotland.

Fumigation of Foodstuffs.

C. L. WILLIAMS (*American Journal of Public Health*, June, 1933) states that an enormous and increased use of fumigation of commodities, whether by atmospheric pressure or in a vacuum chamber, is recorded in the United States of America. A wide range of fumigants is used, including hydrocyanic acid, cyanogen chloride, sulphur dioxide, carbon bisulphide, ethylene oxide, ethylene dichloride, and chloropicrin. The question of absorption of these toxic fumigants is discussed by the author. Fumigants may combine with certain foods, for example, hydrocyanic acid with leuculose, and ethylene oxide with water. No record exists of any human being ever having been killed by eating fumigated food. Where food is cooked before consumption higher proportions are permissible. Tests with mice, chickens and dogs, have given negative results. Every new chemical fumigant should be tested on its own merits. Moist food likely to be consumed after fumigation constitutes

the chief danger. Fumigation of food products cannot be regarded as a public health menace, but the fumigated food for consumption, sale or shipment should be ventilated for not less than twenty-four hours and until the fumigant is no longer detectable by taste or smell.

Brucella Infection and Immunity in Man.

I. F. HUDDLESON, H. W. JOHNSON AND E. E. HAERMANN (*American Journal of Public Health*, September, 1933) record a study of the opsonocytaphagic power of the blood in brucella infection. The fresh whole citrated blood of humans was mixed with an equal amount of a heavy bacterial suspension of living brucella organisms and after incubation and agitation stained. The opsonocytaphagic activity was then estimated according to the number of bacteria ingested. Citrate inhibits the ordinary phagocytosis of normal blood. In addition, the intracutaneous injection of a one in 1,000 dilution of a nucleoprotein fraction of three species of brucella was studied for an allergic response. The cytophagic power is low during the disease, but rises rapidly on recovery and remains high even after four years. All these persons also showed a correspondingly striking allergic response. A definite allergic response with low phagocytosis indicates active infection. Veterinarians and farmers, as contrasted with packers and laboratory workers, may handle brucella material and give positive results to tests, though often a definite attack of the disease did not occur, but only a vague temporary illness. Both *Brucella melitensis* and *abortus* acted similarly. Among stockyard employees, 22.7% showed previous infection; of college students 17%, and of hospital patients 12%.

Control over the Production and Handling of Shellfish.

C. E. GREEN (*American Journal of Public Health*, September, 1933) states that many cases of typhoid fever occurring in 1924-1925 in the United States of America were traced to oysters, and the Surgeon-General of the United States Public Health Service set out minimum requirements for control. In 1932 the three Pacific Coast States conformed to these requirements. Oysters are the important shellfish concerned. As a food the oyster is of a high order, containing vitamins A, B and C, copper, iron, together with iodine, calcium and manganese. Great increase has occurred in oyster production in America by the sowing of Japanese or Pacific oysters. These are hardy and reach maturity early. Potential sewage pollution must be watched for and eliminated, and bacterial examination made of shellfish and of water lying over the beds. Chemical latrines are suitable for excretal disposal. Packing plants must be of modern type. The employees are examined for possible carriers, and they wear rubber aprons and rubber gloves.

Congress Notes.

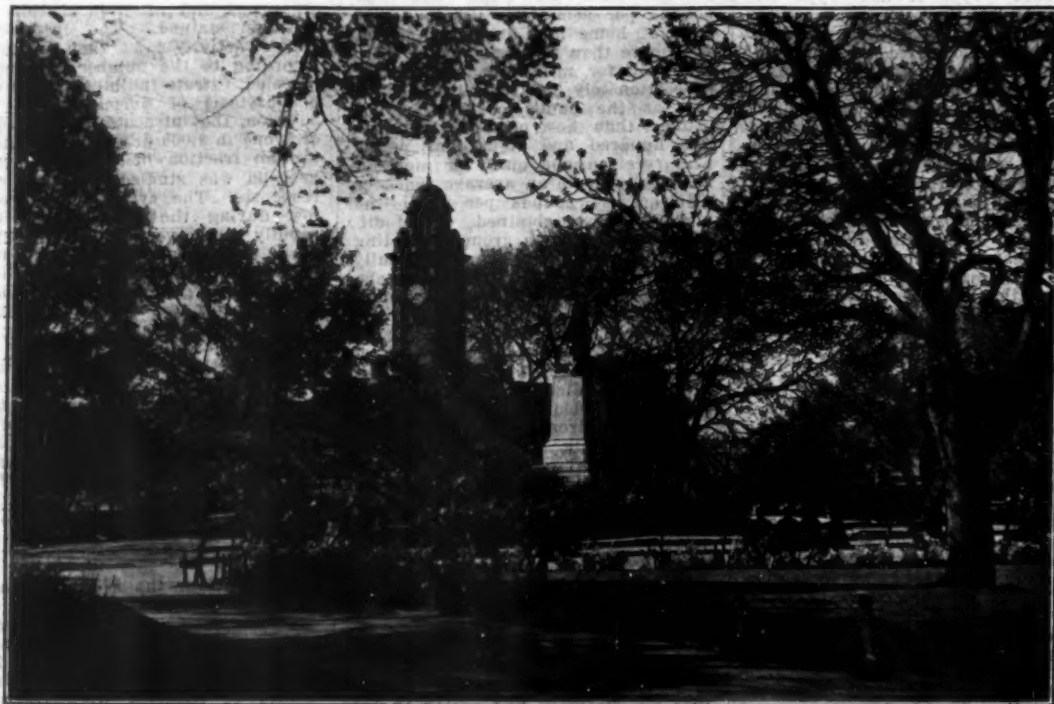
AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION).

Hobart.¹

It would be difficult to believe that a more appropriate or congenial setting could be found in the southern hemisphere for the deliberations of the Fourth Session of the Australasian Medical Congress (British Medical Association) that is to be held at Hobart in January next.

Hobart is the capital of what may be called a unique island, as there are living in Tasmania today creatures which are found only in a fossil state in other parts of the world. Such, for instance, are the marsupial wolf, the so-called "tiger", and the "Tasmanian devil". Then there is a shrimp found in pools on Mount Wellington

The attention given by the French to Tasmania and the southern portion of Australia caused uneasiness both to the home authorities and also to Governor King at Port Jackson. This was not to be wondered at when one recalls the exploration of D'Entrecasteaux, La Perouse's visit to Botany Bay (1788), and the voyage of Du Fresne and the claiming of a section of Western Australia by the French explorer, St. Allouarn (1772). The activities of Admiral Baudin and the rumours that reached the Governor after the departure of the French from Port Jackson caused him to take immediate action. Governor King decided to found a settlement in Tasmania. Lieutenant Bowen was placed in command of the expedition, and on September 8 the *Lady Nelson* arrived at Risdon. The *Albion*, with Bowen on board, arrived on Sunday, September 11. Bowen's landing took place the following day. The foundation of the settlement, therefore, commenced on September 12, 1803. The year 1804 saw a change of considerable importance take place.



General Post Office, Hobart, from Franklin Square.

which is one of the oldest forms of life known. This shrimp (*Anaspides*), according to scientists, is unique and has defied evolution and the process of Nature for countless thousands of years.

Professor Ernest Scott says there is more history of South Sea discovery written on the south-east corner of the map of Tasmania than anywhere else in Australia. Indelibly recorded on this little corner of the world is the visit of Tasman, the Dutchman, who, in 1642, named Storm Bay, the seaward approach to Hobart. Nearly 150 years later came the Frenchman, Marion Du Fresne, in 1772, who later sailed away to New Zealand to end his career at the hands of the Maoris. Then followed in succession Captain Cook's expedition (1773 and 1797), Captain Cox (1789), Bligh, of *Bounty* fame (1789 and 1792), D'Entrecasteaux (1792 and 1793), Captain Hayes (1794), who named the River Derwent, Flinders and Bass (1798), and Baudin (1802).

¹ This article has been kindly prepared by Mr. G. S. Roberts, of Hobart.

David Collins, who had been a judge advocate at the original Port Jackson settlement, had been sent out by the home authorities in charge of a large expedition with the object of founding an additional colony in Australia. His attempt on the shores of Port Phillip had failed, and more than a third of a century was to elapse ere Melbourne sprang into being. Collins for a time was not quite sure where to transfer his people to, but eventually the Derwent was selected, and in February, 1804, the first of his ships reached this river. Collins, in the *Ocean*, anchored off Risdon on February 15 and was unimpressed with the locality and immediately sought another site. A bay on the western side of the river was selected, and on February 19 the ship *Ocean* and the brig *Lady Nelson* were anchored off the then eucalyptus-covered shores of Sullivan's Cove. The following day disembarkation commenced and from the initial camp of February 20, 1804, there sprang the city of Hobart.

Hobart is beautifully situated, having as a background Mount Wellington (4,165 feet). The city creeps up an

undulating range of foothills with curved outlines and hollows full of restful shadows, to the great bulk of Mount Wellington, the silhouette of which, especially when sharply defined against the evening sky, may be compared to that of some plesiosaurus-chameleon, changing its hues with varying positions of the sun, as it lies stretched out in sleep, the head and neck depressed, leaning towards the north, its back elevated near the shoulders, and its tail tapering down for miles in a southerly direction, while the organ pipe formation resembles a portion of its vast anatomy.

Members of the Australasian Medical Congress will see Hobart at its best when they meet in January. Then will the brilliant sunshine clear away the clouds which are wont to brood about the slopes of Mount Wellington, and cast vivid reflections on the placid blue waters of the

Liverpool Street, and from north to south, Elizabeth Street and Murray Street.

In and around the city itself there is a great deal to instruct the visitor, particularly those who are interested in Australian history. There still remain some buildings which date from the very early days, and they appeal to the antiquarian as well as to the lover of the beautiful. The house in Macquarie Street (number 208) once occupied by Joseph Tice Gellibrand is still standing, and from it much of the preliminary organization of Batman's expedition to found Port Phillip must have been carried out. Only last year the cottage near by occupied by the father of John Pascoe Fawkner was demolished. It was of weatherboard and cramped, but had been John's home in his early youth. Thus Hobart is connected with both claimants for the honour of founding Melbourne. The



Surprise Valley, West Coast Road, Tasmania.

[Spurling Photo.]

Derwent, but with a delightful coolness that will be appreciated by those members from the almost tropical sun-baked parts of the Commonwealth. The mean temperature at Hobart in the hottest month (February) is 62.3° F., and in the coldest month (July) 45.7° F.; the hours of sunshine for the year average 1,944.

Hobart Harbour, which is completely landlocked with a bold approach, is renowned as one of the best in the world. The piers are situated at the extremity of the city streets, where there is sixty-two feet of water. The biggest ship in the world can come right alongside without the aid of tugs.

The city of Hobart comprises 17,755 acres, and its 60,000 citizens enjoy no less than 760 acres of parks, gardens, and open spaces, most of which are served by the Council's nineteen miles of tramway.

The main business streets running from east to west are Macquarie Street (Hobart's Harley Street) and

Wesley Church, the foundation stone of which was laid by Sir John Franklin in 1837, is the oldest Methodist church in the Commonwealth, while the Memorial Congregational is the mother church of Congregationalism in the southern hemisphere. A small museum of great interest is housed in the vestry of the Wesley Church. Cottage Green is still in existence, and its erection was commenced in 1804 for Tasmania's first chaplain, the Reverend "Bobby" Knopwood.

The Tasmanian Museum will feature for the congress typical groupings of Tasmanian animals and birds, including such unique fauna as those already alluded to, that is, *Thylacinus*, *Sarcophilus et cetera*. In the Tasmanian rooms there may be seen a splendid representation of a family of Tasmanian natives with their midden at South Arm. No effort has been spared to make this a true picture of the extinct race. Elsewhere in this room are full collections of weapons and other articles

pertaining to their daily life. Attention should be given to the exhibition of early Tasmanian water colours, rare books *et cetera* in the other galleries of the museum and library of the Royal Society.

The little cottage adjacent to the Museum was the house of the private secretary to the early governors, and here a former Tasmanian Governor, Sir Eardley Wilmot, died of a broken heart; here also the late Marquis of Salisbury, Prime Minister of England, lay with typhoid fever when on a world tour during his younger years.

St. David's Park contains much of interest. The noble tomb erected to Colonel David Collins, Tasmania's first governor, by Sir John Franklin marks his grave, which in 1810 was dug within the tiny church, soon to be blown down. This was the first church in the colony. A walk

The foundation stone of Tasmania's stately Tudor-Gothic Government House was laid ninety-one years ago by Sir John Franklin. The house is noted for its beauty, which is enhanced by its admirable situation. His Excellency Sir Ernest Clark has expressed his intention of entertaining the congress members at Government House, and they may take the opportunity of seeing the more than century old gardens of the Royal Society of Tasmania that are adjacent to those of Government House, extending along the western bank of the River Derwent. Here may be seen also the observatory built by Captain Ross and Captain Crozier when the *Erebus* and *Terror* based themselves in Hobart Town for their wonderful Antarctic expedition in the early forties. With the cooperation of Sir John Franklin this little circular building of cut stone was completed in ten days.



Government House, Hobart.

[Beattie Photo.]

around its paths will reveal the headstone of many of Tasmania's pioneer families and a large number whose descendants are now on the mainland.

Saint David's Cathedral, with its noble cloisters, is an architectural gem. Its memorials, stained glass, and oak screen have an attraction that is more of the old than of our comparatively new world. So, too, with Saint Joseph's Church in Macquarie Street, and the others already mentioned.

The main building of the University was built in 1847 as the Hobart High School, and this portion of the building is one of the finest pieces of pure Gothic architecture south of the line. After a long and honourable history as the Hobart High School, it was granted its present status over thirty years ago. It has now flourishing schools of arts, law, science, economics *et cetera*. In its grounds are the buildings of the Phillip Smith Training College, and it is in these two institutions that most of the congress deliberations will take place.

Lady Franklin, too, may be remembered by the perfect little museum (now empty) built to her order in 1842, to be a repository for botanical and forestry specimens. It is a few minutes' walk from the end of the Lenah Valley tram terminus, in its lovely setting of classic hills and mountain streams with Mount Wellington for a background. Its Grecian architecture is acclaimed by artists to be the best of its kind in the southern world, and is a replica of a building seen by Lady Franklin in Greece, in the Vale of Acanthe, from which it derives its name.

One of the most striking features of Hobart is Salamanca Place. Here Parliament House, built by the Royal Engineers as a customs house, with its garden front, and the splendid series of old shipping warehouses facing the new wharf and waterfront form a unique feature of Tasmanian history and architecture. This is a source of great delight to those whose interests are connected with shipping, and recalls past days of sail, when the wharves were lined, sometimes two deep, with whalers,



Richmond Bridge, over Coal River, Richmond, Tasmania.

[Sheppard Photo.]

wool clippers and sailing ships for overseas and inter-colonial trade.

At Bridgewater, ten miles from Hobart, where the railway and roadway cross the River Derwent, may be seen the buildings by the quarry that are relics of the days when the long-causeway was built in the thirties of last century. From here the fly fisherman can work his way up the river with every possibility of taking our trout.

New Norfolk, twelve miles beyond, is a most picturesque spot, surrounded by hop gardens and orchards. Here is the historic Bush Inn with the oldest licence (1825) in the Commonwealth, in the gardens of which Wallace (in 1842) composed "Scenes that are Brightest" for his famous opera "Maritana". The whole Derwent Valley, from Hobart to Russell Falls (National Park), affords a railway trip of scenic splendour.



Lady Franklin Museum, Hobart.

Roads offer in every direction a diversity of scenery and attractions. Crossing the river by the ferry steamer *Lurgurena*, fourteen miles brings one to Richmond, a perfect little old colonial village. The bridge has for 110 years seen the march of local events. All this district and Sorell abound in such old homes as Hardy Wilson has loved to depict in his work on early colonial architecture, and Roy Bridges, the Tasmanian historian and novelist, has commemorated them in several of his books.

South of the city are the broad estuary of the Derwent and D'Entrecasteaux Channel. A day trip by river steamer will give an endless succession of lovely bays and hills embowered with orchards. To break the journey at any little settlement would be an opportunity to sample

Go where you will, Tasmania has unsurpassed scenery. The late Dr. Fitchett described Tasmania thus:

There is no more beautiful patch of soil on the planet. It is rich in forests and running streams, fair with green pastures, picturesque with wild hills and mountain fastnesses, and over it all there is a perfect climate. There is almost no mineral it does not possess, no fruit it cannot grow, no sense it cannot delight, and no want it cannot satisfy. It might well be an earthly paradise.

Such, then, are a few of the attractions that Tasmania has to offer those of the medical profession who accept the cordial invitation extended them, not only by the executive, but by the whole Tasmanian community.



Wesley Church, Hobart.

the berry fruits that are sent to Hobart for jam making and export. Visitors who are yachtsmen will find brothers of the craft who will show them as fine a series of cruising grounds they may wish to sail over.

Motor touring through the Island and a visit to the lakes and streams for trout fishing can be made with ease from Hobart and Launceston. The necessary details for such tours will be arranged by the Tasmanian Government Tourist Bureau on arrival of members, or previously, if they care to write to the Director or call at branch offices in the mainland capitals.

Members who desire to return to the mainland *via* Launceston, Devonport or Burnie, may do so with profit and delight by taking the newly opened West Coast Road to Queenstown, the main line, or the east coast route, including Port Arthur, to Launceston, the charming city of the north, also the route *via* Great Lake, the premier angling ground of the Commonwealth.

Hotel Accommodation.

The Executive Committee of Congress wishes it to be known that ample first class accommodation is still available in Hobart for the period during which congress will meet. Heathorn's Hotel, which was recently closed, has been reopened under new management. This hotel is situated near the railway station and close to the University of Tasmania. The tariff is: bed and breakfast, seven shillings and sixpence; inclusive tariff from twelve shillings and sixpence a day.

Aerial Service.

The fares for aerial services have been reduced. They are as follows: Melbourne to Launceston, five pounds; Melbourne to Hobart, six pounds ten shillings. These fares include transport at each end of the journey. Practically a daily service has been promised in machines carrying from three to ten passengers.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, Adelaide Street, Brisbane, on July 7, 1933, Dr. S. F. McDONALD in the chair.

The Anterior Pituitary: Its Scientific and Clinical Aspects.

Dr. BRUCE MAYES read a paper entitled: "The Anterior Pituitary: Its Scientific and Clinical Aspects" (see page 677).

Dr. J. V. DUHIG thanked Dr. Mayes for his excellent paper. The paper, apart from anything else, had this particular value, that the author was speaking of work of which he had had first hand experience. He had done most of this work himself, in conjunction with men who were very distinguished graduates. His work with them, done in Frankfurt-am-Main and Berlin, was authoritative. Dr. Duhig considered Dr. Mayes had been very moderate in his views. He had gone to great trouble to explain the subject in a very lucid fashion. Dr. Mayes had passed over the question of the growth hormone and gigantism. Recent excavations in Scandinavia had brought to light skulls which showed an enormous increase in the size of the *sella turcica*; the enormous size of the Vikings was probably due to this over-development of the pituitary gland, which was not rare, but seemed to have been a national characteristic. Dr. Duhig had done a *post mortem* examination on an Irishman whose skull showed marked prognathism, which was not natural in Irishmen. It was a common fact that very many of the giants touring the country were Irishmen. Dr. Duhig had secured the pituitary gland from this *post mortem* examination and wished to have Dr. Mayes's opinion on it; chromophile tissue was present in enormous hyperplasia. Dr. Mayes had demonstrated to Dr. Duhig the original technique and work on the pregnancy hormone, and the work had gone on very well at the laboratory. Why was it that the test was not applicable to the urine of the cow? Dr. Duhig again expressed his thanks to Dr. Mayes for his very illuminating address.

Dr. L. BEDFORD ELWELL congratulated Dr. Mayes on his very interesting paper; it was particularly interesting to have the subject discussed by one who had been doing investigations in a very practical way. He had wound up his paper with a very considered and balanced statement, that it would be a mistake to rush to the conclusion that experiments that produced certain results in animals were always applicable to human beings. This was found to apply to recent work in connexion with the pituitary gland. Dr. Elwell then quoted certain cases of Harvey Cushing, reported by Cushing, which bore out this statement.

Dr. L. T. JOBBINS thanked Dr. Mayes for his paper. He inquired concerning the use of active anterior pituitary hormone in the treatment of juvenile amenorrhoea. Apparently parenteral injections lost their effect within twenty-four hours; in such a case would Dr. Mayes give daily doses of "Prolan", and for how long? In the event of menstruation being established, would he continue the "Prolan" or would he cease it immediately and await results?

Dr. G. W. MASON mentioned his appreciation of Dr. Mayes's lecture. It explained the idea that the inquiries into the anterior pituitary and the endocrine organs had a bearing on many subjects. In New York Dr. Mason had seen tests performed on the urine for the presence of "Prolan A" in cases of teratoma of the testis. Injections of 0.1 cubic centimetre of urine were made into miniature female white mice, and conclusions were drawn from the reaction as to whether the disease was progressing or not. If metastases had occurred or were occurring, the urine would again show the presence of the hormone. A schedule had been drawn up showing the number of units

of hormone being excreted through the urine, and where no secondary deposits had as yet clinically occurred the increase in the number of units of the hormone was found to indicate that they would become manifest clinically. Patients were treated with deep X ray therapy over likely areas of recurrence and were tested every month. A fall below four hundred units indicated the disappearance of recurrences. The importance of these reactions was being recognized in every centre and should give encouragement to those who were interested in these subjects.

Dr. J. S. BARR-DAVID said that Dr. Mayes had mentioned at the end of his lecture that anterior pituitary hormone orally administered appeared to be lost in the body. This was probably due to the action of the gastric juice. Had treatment been tried out with this substance in tablets which had a coating to resist the action of the gastric juice, similar to Parke, Davis and Company's "Emplets"? Was it better to use pluriglandular tablets or injections of anterior pituitary hormone in menstrual deficiencies?

Dr. S. F. McDONALD thanked Dr. Mayes for his extraordinarily clear and interesting explanation of a very difficult subject, a concise account of one aspect of the activities of the anterior lobe of the pituitary. To Dr. McDonald the most interesting thing about the pituitary was the amount of difficult and complicated work carried out by such a small organ. The anterior lobe, so small in comparison with the bulk of the thyroid, for instance, yet was far busier. In addition to the work that Dr. Mayes had discussed, in some way the anterior lobe controlled the growth of the body, the deposition of fat through the thyroid, and had some control of glucose metabolism, for it was well known how often the sufferers from Fröhlich's syndrome and had poor glucose tolerance, up to actual diabetes mellitus.

The lack of thyroid control seen in the Brissaud dwarfs and the Fröhlich types was not purely thyroid defect—one could not cure their adiposity merely by giving thyroid, and in the Brissaud dwarf the mental deficiency was more persistent than in the cretin. The problem that arose was that of the actual preparation of these hormones. Was the pregnancy hormone the same as that which activated the sex organs? If the pregnancy hormone were given to patients with Fröhlich's syndrome, would it cause any active effect? Nothing much would be achieved till the hormones were separated, probably as crystalline substance, and synthesized as thyroxin and adrenaline had been.

Dr. Mayes, in reply, thanked the speakers for their words. It had been a great pleasure to him to prepare the paper, and he hoped that he had not let his gynaecological interest run away with him; he had purposely avoided mentioning two or three phases of the anterior pituitary.

With regard to the Aschheim-Zondek pregnancy reaction in man and in quadrupeds, this had been very thoroughly and exhaustively worked out and, surprisingly enough, to his knowledge it was actually only in man, the orang-outang and the *Macacus rhesus* that the reaction was valid. The urine of quadrupeds and of all commoner animals had been used, and no positive result was obtained with the test. The reason most favoured for this negative result was that it was in some way bound up with the difference in the placenta and its implantation. Humans and monkeys had one large complete placenta. The placenta in other animals was often made up of distinct and isolated cotyledons, and its structure was entirely different. Although the pituitary gland during pregnancy was markedly enlarged, if it were implanted, it gave a negative effect; the pituitary from non-pregnant women would give a positive effect. The question arose, after implantation and development of the placenta, did the placental tissue take over the function of the pituitary and produce an enormous quantity of hormone? This theory was supported by the fact that in hydatid mole tremendous quantities of hormone were produced.

With regard to the treatment of amenorrhoea, Dr. Mayes said that he could speak only of his own results and that it was very difficult to give a general idea of treatment. He had had patients menstruating for

irregular periods since puberty and then having amenorrhoea for periods from three to twelve months. He gave "Prolan", one cubic centimetre, intramuscularly on alternate days for six doses, and in cases that responded this treatment was followed in a week or two by menstruation. He then counted twenty-eight days ahead and three more injections were given immediately before the next period was due. Generally this menstruation was not quite so heavy as the one before. Then it was attempted to carry on treatment with the anterior pituitary hormone orally. One did get a definite clinical response by giving "Prolan" pellets orally, and if this were so, the question of the substance being destroyed by the gastric juices would not arise.

With regard to pluriglandular treatment, Dr. Mayes thought that in giving anterior lobe preparations one was assuming that the whole trouble was due to deficiency of the anterior lobe. This was usually the case, but if the pituitary were perhaps backward, the ovaries would also be somewhat lacking in development, and treatment by pluriglandular tablets was very normal. This was particularly so if the patients did not respond to anterior pituitary products only. Oral administration of ovarian hormones was quite sound and rational, for example, in menopausal symptoms.

In reply to Dr. McDonald, Dr. Mayes said that the question of glucose was a very important one in the functions of the anterior pituitary gland and also the gland's relations to other glands, particularly the thyroid. In *dystrophia adiposa*, *acromegaly et cetera*, the glucose tolerance was estimated as a routine with the metabolic rate in all cases. The thyroid gland was very important. Original work on this, so far as Dr. Mayes knew, was only very recent. The pregnancy hormone was the same as the sex hormone, which could be used in the treatment of Fröhlich's syndrome *et cetera*. Dr. Mayes thought, from the work done on the subject, that the two hormones were probably identical, and the first real source thought of was the urine of pregnant women.

Dr. McDonald had struck the keynote of future success in this subject by mentioning the preparation of these hormones. Once their chemical nature was known and they could be reduced to a crystalline substance, a great advance would have been made. Dr. Mayes thought glandular therapy had been brought into great disrepute by the number of preparations on the market and by the large number of indications for use given on their wrappings. There was a scientific application for these things.

A MEETING OF THE SECTION OF MEDICINE OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the British Medical Association House, Macquarie Street, Sydney, on September 14, 1933, Dr. S. A. SMITH, the Chairman, in the chair.

Electrocardiography.

Dr. A. J. HOOD STOBO read a paper entitled: "The Clinical Value of the Electrocardiogram" (see page 682).

Dr. C. B. BLACKBURN offered his congratulations to Dr. Stobo on his excellent paper. Dr. Blackburn remarked that some years previously he and Dr. Ritchie had been responsible for getting Dr. Stobo to take up the work of electrocardiography. He had since obtained a great deal of satisfaction from the application of electrocardiography in his practice. He was particularly interested in the so-called fourth lead. He had recently seen in consultation a man who had had several attacks of gripping pain on walking up stairs and then suddenly one night had been taken desperately ill; he had been so ill in fact that he was convinced that he was going to die immediately. The medical practitioner who was called in had formed the opinion that death was imminent. The patient had developed a pyrexia the next day and, when seen by Dr. Blackburn, presented the typical picture of coronary occlusion. Dr. Stobo had taken an electrocardiograph, which, however, had been normal. Three months later Dr. Stobo had taken another electrocardiograph, in which the fourth lead tracing was typical of coronary occlusion

as far as was known. Dr. Blackburn remarked that it appeared as though the fourth lead might prove to be of great service.

Dr. HAROLD RITCHIE said that he wished to echo the praises expressed by Dr. Blackburn. Dr. Stobo's paper was an excellent one and his claims perhaps unduly modest. Dr. Stobo seemed to regard the clinical diagnosis of coronary occlusion as much easier than he (Dr. Ritchie) had sometimes found it. Dr. Ritchie urged all clinicians to make use of the electrocardiograph in the investigation of the cause of every cardiac pain. He thought that possibly the most interesting and important thing in Dr. Stobo's paper was that relating to the electrocardiographic findings, more especially the changes in the T wave, in progressive sclerosis of the coronary vessels. He hoped that Dr. Stobo would bring forward more evidence on this subject.

Dr. JOSEPH COEN remarked that he wished to add his praises for the excellent set of records shown by Dr. Stobo. The paper reflected the latest work in electrocardiography. Dr. Coen was particularly interested in the fourth lead, for he believed it represented a very great advance and would perhaps be the means of eliminating the disappointing results that were sometimes obtained without it. He did not know whether Dr. Stobo had stressed the point; but sometimes there was inversion of the T wave in hypertension, whether due to the hypertension or ventricular hypertrophy. In a series of cases that Willius had followed up it had been found that these waves were associated with a very high mortality rate, even among people between the ages of forty and fifty years. Death had occurred in twelve months or two years in 50% of cases. The inversion of the T wave was also common in aortic regurgitation, in which the myocardium might be damaged by the syphilitic infection. Dr. Coen concluded by remarking that the paper showed the necessity for electrocardiography in all cases in which the diagnosis was in doubt.

Dr. A. W. HOLMES & COURT expressed his appreciation of the material presented in the paper and the delightful manner in which it had been delivered. It was always pleasant and instructive to listen to a man who was master of his subject, especially when he was dealing with the fruits of his own experience. The opinions expressed in such circumstances carried much more weight than those formed on the results of work carried out by others. He thought that Dr. Stobo was right in saying that there might be gross changes in the heart without any alteration in the electrocardiograph; but, on the other hand, electrocardiography was of great value in the differentiation of cardiac infarction from conditions that might simulate it—perforation of a gastric ulcer, for example.

Dr. G. C. WILLCOCKS asked whether Dr. Stobo had taken any records from patients actually suffering from an attack of *angina pectoris* or Stokes-Adams syndrome. He referred to the type of *angina* in which it was possible to note the change of pulse from a normal rhythm to a grossly irregular rhythm. The type of Stokes-Adams syndrome he had in mind was that occurring at rare intervals. He had seen a patient who suffered such an attack at intervals of five years. He suggested that the condition might be due to a sort of coronary spasm.

Dr. WILFRED EVANS expressed his thanks to Dr. Stobo for his extremely interesting paper. Dr. Stobo had given an excellent description of the clinical significance of electrocardiographic findings. Dr. Evans then showed four electrocardiographic tracings illustrating how auricular fibrillation with a slow heart beat could be differentiated with certainty from a condition in which there were frequently recurring extrasystoles, and the help given by electrocardiography in myocarditis associated with coronary arteriosclerosis. Dr. Evans went on to remark that, as Dr. Stobo had pointed out, electrocardiography was of the greatest value in coronary thrombosis. This disorder had claimed great attention since it had been first described a few years previously, and Dr. Evans thought that medical practitioners were too ready to make the diagnosis. Coronary thrombosis could be responsible for any type of tracing, from that of auricular fibrillation

to bundle branch block; but only two types were distinctive: the Pardee curve, the deeply inverted *T* wave with a semilunar curve, and possibly the prominent *Q* wave in Lead III. A change in the tracing from week to week was also characteristic. It was important, if possible, to distinguish a slowly developing arteriosclerosis from complete block of the coronary artery with thrombus, for the prognosis was quite different in the two conditions. The tracings were often similar, and the history and the clinical features must often decide. Dr. Evans preferred the terms coronary sclerosis and coronary thrombosis to coronary occlusion, which suggested a complete blockage. Dr. Evans then showed a series of tracings which, he stated, presented many features suggestive of coronary thrombosis but which, in his opinion, were not due to that condition. Dr. Evans said that they presented a striking similarity. Electrocardiographs of patients suffering from syphilitic aortic regurgitation with cardiac hypertrophy were often of this type; these tracings were not so common in cardiac hypertrophy from other causes, and only occasionally occurred in rheumatic aortic regurgitation. Dr. Evans stated that the tracings presented many of the features of right branch bundle block, the chief difference being that the *QRS* complex was not split or widened, because there was no interference with conduction; the explanation probably depended mainly on the pronounced left ventricular hypertrophy and the left-sided preponderance which in some way seemed to influence the direction of the *T* waves, as in branch bundle block; coronary narrowing might play a small part, but it could not be a great factor, in the rheumatic cases at least.

Dr. A. S. WALKER added his congratulations and remarked that, as Dr. Holmes & Court had pointed out, the paper was based on extended personal experience and therefore was of added value. He had had the privilege of discussing electrocardiography with Dr. Stobo, and he could say that Dr. Stobo had endeavoured to correlate his findings with the clinical and pathological findings. The modern trend seemed to be to stress the importance of electrocardiography in investigating the nutrition of and the circulation in the heart; the fourth lead promised to be of great value in the investigation of abnormalities in this circulation. The changes discussed by Dr. Evans and Dr. Coen were probably due to malnutrition, the result of syphilitic and other vascular diseases. While in London recently, he had had the privilege of seeing the effects of *angina pectoris* on the electrocardiographic tracing, and he had seen the flattening or inversion of the *T* wave restored by the administration of amyl nitrite. Dr. Walker went on to say that as most of the diseases of the heart were primarily vascular, the importance of electrocardiography became patent. In regard to the number of cases in which electrocardiography failed to reveal positive evidence, Dr. Walker remarked that no single procedure in medicine was perfect; exceptions were always found, and if electrocardiography sometimes failed, it could be said that it was only like all other diagnostic methods in that respect. He was sure that all had listened with pleasure and profit to Dr. Stobo's paper. The value of electrocardiography was twofold: it enabled the making of an accurate diagnosis and it assisted investigation of underlying pathological problems.

Dr. S. A. SMITH expressed his congratulations to Dr. Stobo on the modesty and moderation with which he had discussed the value of electrocardiography. Dr. Smith said that his mind ran back to the time, not far distant, when the view had been held that electrocardiography was of value only in the study of the arrhythmias. He believed that it had its greatest value in the information given concerning the condition of the heart muscle. He agreed that changes in the muscle were due in the main to vascular causes. Dr. Stobo had spoken interestingly on the future of clinical research with the electrocardiograph, especially with reference to the fourth or chest lead. In addition to this, Dr. Smith drew attention to recent work on the *Q* wave. Pardee had mentioned some characteristics of this in the electrocardiograms of patients who had suffered coronary occlusions, and recently a group of American investigators had carefully investigated the

original ventricular deflection in such hearts and recognized some important changes. Wood and Wolferth had shown that in the fourth lead tracing of the normal heart the *Q* wave was particularly well marked. Dr. Smith had noticed that in the fourth lead records of patients with undoubted coronary occlusion, shown by Dr. Stobo, the *Q* wave was small or absent.

Dr. Stobo, in reply, thanked the various speakers for their appreciation of his paper and stated that he could never express sufficient gratitude to Dr. Blackburn, Dr. Ritchie and Dr. Holmes & Court for having been the means of his becoming interested in electrocardiography. He said that in the main his reply must be directed to the questions raised by Dr. Evans and Dr. Coen. He felt that in regard to their beliefs the main difficulty was one of nomenclature, and he stressed the necessity for an understanding of the difference between an acute coronary artery thrombosis and coronary artery occlusion or chronic coronary narrowing due to *endarteritis obliterans*. In both the ultimate effect was the same, and some disturbance of myocardial nutrition occurred, which disturbance he held to be the cause of the changes in the *T* wave that he had described. In arteriosclerosis it was only reasonable to expect that if it were such as eventually to cause hypertension and ventricular hypertrophy, there would also be some vascular degeneration in the coronary circulation.

The question of the electrocardiographic changes in cardio-vascular syphilis had been very fully dealt with by Chamberlain in *The Lancet* of July 1, 1933. Chamberlain stated that in an investigation of 221 patients suffering from syphilitic aortic regurgitation no typical changes in the electrocardiogram occurred which could be attributed to the syphilitic nature of the affection. In the same article Chamberlain quoted work by Clawson and Bell, who stated that as a result of 126 *post mortem* examinations in cases of syphilitic aortitis no myocardial changes had been detected which could not have been explained by mild coronary artery disease of a non-specific nature.

In these cases also the question of nomenclature presented some difficulties, the essential pathological change in syphilis was caused by *endarteritis obliterans*, which could quite rightly be called coronary artery occlusion, though it differed from an acute coronary artery thrombosis very greatly. From the electrocardiographic point of view, however, the resultant changes were in both cases due to an interference with myocardial nutrition.

In reply to Dr. Willcocks, Dr. Stobo stated that he had not had an opportunity of taking electrocardiograms under the conditions mentioned. Recently, however, he had taken a record of a patient during an attack of precordial pain. The record showed marked inversion of the *T* wave in Lead III and slight inversion of the *T* wave in Lead II. For interest he had taken another record two days later, after the patient had rested and had become free of pain; the *T* waves in both Leads II and III had then been very much more sharply inverted. The changes were the opposite to what would have been expected, and he could not explain why they had occurred.

In reply to Dr. Smith, Dr. Stobo stated that he had not made an analysis of the *Q* waves in the antero-posterior leads, but that he would do so.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Women's Hospital on July 19, 1933. The meeting took the form of a series of clinical demonstrations by the members of the honorary staff.

Prolapse of the Uterus.

Dr. EDWARD WHITE demonstrated a patient with procidentia; she was aged fifty-four years, with four children, and the uterus had completely prolapsed for two years.

The second patient was aged sixty-seven years, with eight children, and had complained of falling womb for three years. She had a procidentia and a third degree cystocele. The Manchester (Fothergill) operation had been performed three weeks ago.

The next patient was aged forty-eight years and had five children; she had falling womb for one year and had worn a pessary for six months. There was a second degree prolapse, a third degree cystocele, and a yellow leucorrhœa. The Manchester operation was done two weeks ago.

The fourth patient was aged forty-five years, with one child. She had dysmenorrhœa, menorrhagia, and a yellow leucorrhœa; a second degree prolapse was noted. The Mayo vaginal hysterectomy was carried out and the broad ligaments tightly bootlaced together to relieve the prolapse.

These operations had all been completed with a colpo-perineorrhaphy.

Thrombophlebitis of the Femoral Vein.

The next patient was aged fifty-five years, with two children. She had, three months ago, an acute thrombophlebitis of the right femoral vein, which caused a condition of "white leg". This was regarded as a complication not due to the pelvic tumours, but the possibility of mechanical pressure on the pelvic veins was discussed.

Leucorrhœa.

The next patient was single, aged thirty-two years, and had a profuse yellow leucorrhœa for eleven years, probably of gonorrhœal origin, though no gonococci were now found. Electrocoagulation of the endocervix was done three weeks ago, and the cervix was now clean and healing.

Chorion-Epithelioma.

Dr. White's last patient was aged thirty-nine years and had three children. She was admitted into hospital eighteen months ago, after curettage of the uterus elsewhere for hydatidiform mole. She also had septicæmia, as from blood culture there was grown a gas-forming bacillus, not *Bacillus welchii*. On account of uterine hæmorrhage, the cavity of the uterus was twice explored, mainly by the finger, and on the second occasion evidence of chorion-epithelioma was obtained from the blood clot and fragments. She recovered with the help of two transfusions of citrated blood, each of 560 cubic centimetres (one pint). Four weeks later panhysterectomy was performed, and embedded in the muscle wall of the fundus was a chorion-epithelioma, resembling in size and appearance a small mulberry. The woman was low well and increasing in weight.

Salpingitis and Pelvic Cellulitis.

Dr. A. SHERWIN demonstrated cases of (a) salpingitis and (b) pelvic cellulitis, outlining and contrasting the methods of treatment adopted in each.

Intestinal Obstruction.

Dr. Sherwin also showed charts and X ray reports on two cases of acute intestinal obstruction necessitating a bowel resection in each instance. In one the obstruction in the small intestine was caused by a widespread mass of adhesions in the pelvis following on hysterectomy, appendectomy and left salpingo-oophorectomy, performed in another State eight years previously. In the other the obstruction in the small intestine close to the ileo-caecal junction was caused by a band of adhesion following right oophorectomy and appendectomy four years previously.

Pyelography and Urological Conditions.

Dr. LEON JONA showed pyelograms of patients, all of whom had symptoms referable to the kidney. The pyelograms were nearly all apparently within normal limits, yet pyeloscopy revealed dysfunction in relation to the activity of the calyces, pelvis or ureter. In most cases they responded readily to medical treatment, the necessity for nephrectomy, which had been recommended in some cases, being thus avoided.

A case of tumour of the lower pole of the kidney with obliteration of the lower calyx was also shown.

Radiograms were also shown of a patient who had been operated on at another hospital for femoral hernia by the low incision, and a process of the bladder on to the sac had apparently been cut off. The result was a large

abscess in Retzius's space communicating with the bladder. The whole condition cleared up on treatment.

Tracings were also shown obtained by connecting the inlying urteric catheter to a manometer and writing point. These showed various forms of dysfunction and also the effects of various drugs. They also formed a permanent record which could be compared with subsequent tracings.

Cinematograph Film of Cæsarean Section.

Dr. ELLIOT TRUE showed a cinematograph film of the classical Cæsarean section operation performed under local anaesthesia induced by the infiltration method. "Novocain", 1% for skin and 0.5% for other tissues, was used without adrenaline. The uterus was not infiltrated.

A method of suturing the uterus by mattress sutures was demonstrated in the film. Two large interrupted mattress sutures of chromicized gut in a long straight needle were inserted through all layers of the uterus except the endometrium. These were tied and uterine hæmorrhage was promptly controlled. A second layer of continuous mattress sutures was next used, obtaining close apposition of muscular layers of the uterus, and a third layer approximated the peritoneal surfaces.

The advantages claimed for this method were: (i) rapid control of hæmorrhage, (ii) celerity of operation, (iii) close apposition of the cut uterine surfaces. Dr. True said that the after-results had been entirely satisfactory.

Spinal Deformity.

Dr. True also presented three patients with marked spinal deformity without any distortion of the pelvis. Each patient had a normal labour.

Malignant Disease of the Breast.

Another patient had a radical breast amputation for carcinoma performed by Dr. Milne Sutherland six weeks before the birth of the baby. The baby was immediately weaned and the patient was receiving deep therapy treatment.

Herpes Gestationis.

An unusual example of *herpes gestationis* was presented by Dr. True. The condition appeared between the third and fourth month of each of the patient's three pregnancies and persisted throughout the period of gestation. It commenced as an erythematous patch, rapidly developed bullæ, which broke, and the surfaces were prone to infection. The condition became worse during the puerperium, and on previous occasions had persisted about eight weeks after birth of the baby. It had been very resistant to all forms of treatment.

Rupture of the Uterus.

PROFESSOR R. MARSHALL ALLAN detailed the case histories and showed specimens of two cases of rupture of the uterus during labour. He also presented in tabular form eighteen cases of rupture occurring at the Women's Hospital during the period 1921-1933. These cases were summarized as follows: Transverse presentation, four; rupture of scar of previous Cæsarean section, four; quiet rupture of unknown origin, four; contracted pelvis and disproportion, three; hydrocephalus, three. The maternal mortality rate was 66% and all the infants were still-born.

The ætiology and mechanism of rupture were explained by diagrams. The majority occurred late in labour, and particularly during attempts at delivery. Professor Allan drew attention to the fact that while collapse during or after labour might be due to several causes, rupture must first be excluded by a careful exploration of the interior of the uterus. After stressing prophylaxis, Professor Allan stressed the indications for expectant as compared with surgical treatment. Recent surveys showed that subtotal hysterectomy on the whole gave better results than complete removal of the uterus. The prognosis depended not only on the method of treatment, but also to a greater extent on other factors: the amount of previous traumatism, the amount of blood lost, the presence of sepsis and the severity of shock.

Pneumonia in the New-Born.

DR. KATE CAMPBELL showed histories and charts illustrating pneumonia in the new-born. She said that two types were encountered: (1) insufflation pneumonia, (2) atelectatic pneumonia.

Insufflation pneumonia symptoms appeared on the first day of life on arrival from the labour ward. Cyanosis was present, the respirations were rapid and distressed—50 to 100 per minute. Pyrexia was usually not very high—about 101°. There might be twitchings or convulsions. Usually no cough was evident. The child looked very ill, was difficult to feed, and might require gavage. Signs of bronchopneumonia with many moist sounds were present in the lungs.

Three types of atelectatic pneumonia might be distinguished. In the first group there might have been normal delivery, the child had cried well after birth and the condition had been quite satisfactory up to the time of the pneumonia. In the next type there might have been a difficult delivery, the baby having required resuscitation, but recovery had been apparently complete and the infant well till the onset of pneumonia. In the third group the infant had had signs and symptoms of atelectasis from the time of birth, the pneumonia supervening some days later. In Groups I and II the first symptom might be a convulsion or an attack of collapse. In others a rise of temperature might be the first symptom, the temperature being 37.2° to 37.8° C. (99° to 100° F.) or up to 39.4° C. (103° F.). Respirations were rapid. Cough was absent and cyanosis was at first not apparent. The child rapidly became acutely ill. Physical signs in Groups I and II might be few and slight. Sometimes evanescent crepitations were detected after deep breathing; often impairment of the percussion note was present. In the early stages there was generally no change in the character of breath sounds, though there was often diminution in their intensity. In Group III the infant had had symptoms and signs of atelectasis—restricted thoracic respiratory excursions, continuous or paroxysmal cyanosis, rapid but not distressed respirations. The infant took its food badly and might have a slow pulse. Sometimes a cry similar to a hydrocephalic cry was present.

Signs during this stage varied. There might be poor air entry into one or both lungs, harsh broncho-vesicular type of breath sound, often many fluid râles, sometimes a profuse frothy bronchorrhoea, rarely some impairment of percussion.

With the onset of pneumonia the infant had a rise in temperature. The respirations became more frequent and distressed, cyanosis increased, and the infant's general condition became much worse. There was not much alteration in the physical signs.

Dr. Campbell discussed the treatment of pneumonia under five headings:

1. Conservation of the infant's energy. The infant was not removed from its bassinet. If the mother was in bed, the breast milk was expressed and fed to the infant. Sponging, changing *et cetera* were all done in the bassinet. All nursing and handling was done as gently as possible.

2. Use of stimulants. Routine stimulants used were brandy and "Coramine", 0.25 to 0.5 cubic centimetre. In emergency, ephedrine, camphor, 0.03 gramme (half a grain) and "Coramine". If there was evidence of much mucus in the bronchial tree atropine in doses of 0.32 to 0.22 milligramme (one two-hundredth to one three-hundredth of a grain) was useful.

3. Administration of food frequently and in small amounts was desirable, when necessary by gavage. Boiled water, or better, water and glucose were given freely.

4. Posture. The infant was propped up and placed on its back or on the affected side.

5. Carbon dioxide in oxygen was given at regular intervals and also as occasion might arise.

Treatment of Intracranial Haemorrhage in the New-Born.

Dr. Campbell discussed the treatment of intracranial haemorrhage in the new-born. She said that extreme gentleness and care in nursing and handling were essential. The baby was never taken from its bassinet till

clinical signs indicated that haemorrhage had ceased some days previously. The upright posture was a useful adjunct to treatment. This had been shown experimentally to lessen the pressure in the venous sinuses. The bassinet was placed on blocks at the head of the bed and the infant was kept from slipping down by a pillow slung in the manner usual to a patient in Fowler's position. Injection of whole blood intramuscularly was useful, as it favoured clotting. Usually ten to fifteen cubic centimetres were given. Administration of sedatives, such as chloral hydrate and sodium bromide, was, of course, necessary to control twitching and convulsions. The advisability in severe cases of using lumbar puncture and *cisterna magna* puncture was debatable. The subsequent history in these severe cases was generally one of mental deficiency, and it was a question whether it was desirable to save these infants.

Syphilitic Epiphysitis in a Premature Infant.

Dr. Campbell demonstrated a case of syphilitic epiphysitis in a premature infant. She said that the interesting point was that while clinically only one limb showed signs of epiphysitis, X ray examination revealed them in almost all the long bones of the body. This frequently happened. The infant was seven months premature, one of twins; its weight was three pounds fourteen ounces. The other infant was still-born and macerated; its weight was three pounds eleven ounces. The infant developed satisfactorily on breast milk and a complementary feeding. On the twenty-fourth day the right thigh became swollen and painful; later the right leg and foot became oedematous. No other stigmata of syphilis other than a palpable spleen were present. X ray examination revealed widespread syphilitic affection of practically all the long bones of the skeleton.

The Wassermann test of both the mother and infant gave a positive reaction. Even during the time when this florid symptom of syphilis was present the infant's general condition continued to be good and it gained well in weight.

Exophthalmic Goitre.

DR. W. IVON HAYES showed a patient who suffered from exophthalmic goitre and who was about twelve weeks pregnant. She was aged thirty-one years and had three children, the last born five years previously. Since the birth of the last child the patient had felt weak and had lost weight. During the last two years she had become much worse, and a year ago she was treated by iodine preparatory to an operation, but she then refused any surgical treatment. At present her condition was typical of exophthalmic goitre, with thyroid enlargement, exophthalmos, tremor and tachycardia. She had been sent into hospital for termination of a twelve weeks pregnancy, but it had been decided to leave this condition alone and to submit her to a thyroidectomy after suitable medical treatment. It was pointed out that the toxic condition was not affecting the pregnancy, nor the pregnancy the goitre, and if the thyroid were removed there was a very good chance that the pregnancy would continue to term.

Chronic Nephritis, Cardiac Failure, Acute Pulmonary Oedema.

Dr. Hayes also showed a patient, aged thirty-five years, who had five children and who was thirty-two weeks pregnant. She had no previous history of cardiac or renal disease, but had been admitted to hospital with acute pulmonary oedema. She was cyanosed, the pulse rate was 148, the temperature 36.1° C. (97° F.), and the respiration rate 48 per minute. The systolic blood pressure was 210 millimetres of mercury and there was no albuminuria, but this appeared the following day. Her condition was considered to be due to cardiac failure complicating cardio-renal disease, and she was given atropine and digitalis with mild eliminative treatment. She improved fairly rapidly under this and now felt quite well. However, the fundi showed evidence of arteriosclerotic disease, the blood urea was 38 milligrammes per 100 cubic centimetres, and the urine showed "one-sixth" albumin on boiling. The condition was probably one of chronic nephritis with

cardiac failure causing pulmonary edema, and later a superimposed renal toxæmia due to the pregnancy. Treatment was then being directed particularly to the toxæmic condition and further treatment would depend on the way she reacted to it.

Cerebral Tumour.

Dr. Hayes's third patient had had five children, was thirty-nine years of age, and was thirty-two weeks pregnant. She was in good health until the last two weeks, when she complained of insomnia, headaches, loss of memory, and she suffered from recurrent delusions. Examination revealed the following: The cerebro-spinal fluid was under increased tension, but otherwise was not abnormal; there was bilateral papilloedema, commencing and more marked in the left eye; there was paresis of the third left cranial nerve and of the seventh and twelfth cranial nerves; the speech centre was affected and there was a right-sided tremor of the upper limb. X ray examination of the skull revealed no pathological change. There was almost certainly a cerebral tumour present, and the rapid development of the condition was remarked.¹

NOMINATIONS AND ELECTIONS.

The undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Ada, William Maurice, M.B., B.S., 1931 (Univ. Sydney), St. George District Hospital, Kogarah.

Ross, Alexander William, M.B., B.S., 1930 (Univ. Sydney), c.o. Dr. M. Thomas, Manly.

University Intelligence.

THE UNIVERSITY OF MELBOURNE.

The Registrar of the University of Melbourne reports that a course of twelve lectures in normal psychology is being introduced into the M.B. course between the end of the third year and the beginning of the fourth year. The course is to be given by Professor J. Alexander Gunn, B.Sc., M.A., Ph.D.

The Beattie-Smith Lectures are to be given this year by Dr. Oliver Latham, of Sydney, and will be delivered in the hall of the British Medical Association, Melbourne, on Tuesday, Wednesday and Thursday, December 5, 6 and 7.

Professor P. MacCallum, Professor of Pathology, has been granted a year's leave of absence to visit Europe and will be away during 1934.

Two new regulations, dealing with radiology, have recently been passed. They are as follows.

Chapter III, Regulation XIXd.—Diploma of Therapeutic Radiology and Electricity.

1. Every candidate entering on the course for the Diploma of Therapeutic Radiology and Electricity shall be a Bachelor of Medicine and of Surgery of at least two years' standing in the University of Melbourne, or in some other University recognised by it, or shall possess the same standing in respect of a qualification entitling him to registration as a legally qualified medical practitioner in the United Kingdom.

2. The examination shall be in two parts, viz.:

Part I.—Anatomy (Surgical).

Physics (Part I).

Part II.—Physics (Part II).

Radiotherapy and Electrotherapy.

Pathology.

¹Since the meeting the Wassermann test has been found to give a strongly positive reaction, and antiaphilic treatment has been instituted with benefit to the patient.

3. Subsequently to attaining the standing required in Section I candidates shall

(a) Before admission to the courses in Physics submit evidence to the satisfaction of the Faculty of Medicine, of having by preparatory study fitted themselves to enter upon the course.¹

(b) Complete special courses of instruction in the subjects of Part I of the examination.

(c) Pass the examination in Part I which shall be held at the beginning of the Third Term.

(d) Complete special courses of instruction in Physics (Part II) and Pathology.

(e) Produce certificates of having pursued in the special departments of recognised hospitals and institutions for nine months a course of study and practical instruction approved by the Faculty of Medicine in the subject of Radiotherapy and for six months in that of Electrotherapy, and of having obtained approval of a detailed record of work done by the candidate during the course.

4. In special circumstances the Faculty of Medicine may grant to candidates exemptions from attending such parts of the course as it may define.

5. Candidates who have fulfilled the requirements of Section 3 may be admitted to the examination in Part II, which shall be held at the beginning of the First Term.

6. Special examinations may, if required, be held in Part I at the beginning of the first term and in Part II at the beginning of the Third Term, but candidates will not be admitted to such examinations except with the approval of the Faculty of Medicine.

7. Candidates who have passed in both parts of the examination and who have otherwise fulfilled the prescribed conditions may be granted the Diploma of Therapeutic Radiology and Electricity.

Chapter III, Regulation XIXe.—Diploma of Diagnostic Radiology.

1. Every candidate entering on the course for the Diploma of Diagnostic Radiology shall be a Bachelor of Medicine and of Surgery of at least two years' standing in the University of Melbourne or in some other University recognised by it or shall possess the same standing in respect of a qualification entitling him to registration as a legally qualified medical practitioner in the United Kingdom.

2. The examination shall be in two parts, viz.:

Part I.—Anatomy.

Physiology.

Physics.

Part II.—Radiodiagnosis.

Pathology.

3. Subsequently to attaining the standing required in Section I candidates shall

(a) Before admission to the course of Physics submit evidence to the satisfaction of the Faculty of Medicine of having by preparatory study fitted themselves to enter upon the course.¹

(b) Complete special courses of instruction in the subjects of Part I of the examination.

(c) Pass the examination in Part I which shall be held at the beginning of the Third Term.

(d) Complete a special course of instruction in Pathology.

(e) Produce certificates of having pursued in the special departments of recognised hospitals and institutions for nine months a course of study and practical instruction approved by the Faculty of Medicine in the subject of Radiodiagnosis and of having obtained approval of a detailed record of the work done by the candidate during the course.

¹The evidence necessary is that of having passed Natural Philosophy (Medical Course) or its equivalent and of having studied certain sections of the Physics Text-book for Medical Students issued by the Natural Philosophy Department (latest edition). The Professor of Natural Philosophy will certify to the fitness of candidates to be admitted to the course.

4. In special circumstances the Faculty of Medicine may grant to candidates exemptions from attending such parts of the course as it may define.

5. Candidates who have fulfilled the requirements of Section 3 may be admitted to the examination in Part II, which shall be held at the beginning of the first term.

6. Special examinations may, if required, be held in Part I at the beginning of the first term, and in Part II at the beginning of the third term, but candidates will not be admitted to such examinations except with the approval of the Faculty of Medicine.

7. Candidates who have passed in both parts of the examination and who have otherwise fulfilled the prescribed conditions may be granted the Diploma of Diagnostic Radiology.

Correspondence.

HYDATID DISEASE OF THE PELVIS.

SIR: The following may be of interest.

A man, aged sixty-one years, came up to out-patients complaining of difficulty of micturition for one week.

On examination the abdomen was tremendously distended and a large cystic tumour could be felt over the right side. Two hard nodules were also palpable in the left iliac region. Catheterization rendered twenty ounces of residual urine.

At operation twenty-six pints of caseous suppurative material containing daughter cysts were drained from a most extensive hydatid cyst cavity which extended from the right iliac fossa up to the fourth thoracic interspace, the liver being displaced wholly to the left. The smaller nodules turned out to be tense daughter cysts.

He died four days later from cardiac incompetence, and unfortunately a *post mortem* was not obtainable.

It appeared that the patient had spent a considerable time in South America fifteen years ago.

Hydatid disease is rarely seen in England, and the extent of such an hydatid cyst was rather surprising.

Yours, etc.,

ERIC GOULSTON.

St. John's Hospital,
Lewisham,
London,
October 12, 1933.

SHALL THE TONSIL BE OUR TOTEM?

SIR: Dr. Ellery's letter in the October 21 issue of your journal shows no improvement on his last one. Criticism is always welcome, as its chief use is to point out errors and wrong deductions and thereby aid in advancing knowledge. Dr. Ellery's letter has not advanced our knowledge in any way, but he has amused himself with satire, which I feel sure he is immensely proud of. My letter in the August 5 issue clearly states my views, which are the result of half a lifetime's investigation. Men at my time of life and with a number of years of hospital clinical experience do not rashly make statements without sound grounds for them. If they are wrong, it is up to Dr. Ellery to prove them so. As far back as 1920 I found that 58% of my out-patients were suffering from diseases due to these focal infections, and very soon after that reports came from the Mayo Clinic putting a very much higher figure. Since then we have found that many skin lesions, both allergic and otherwise, are directly responsible to them. The same applies to blood diseases and a host of other things; so much so is this that many are coming to the conclusion that nearly all pathological changes in the body are the result of organisms directly or indirectly. If we exclude syphilis and tubercle, there is very little left but the streptococcus and allied organisms. There can be no limit to the class of tissue invaded, as the organisms are blood-borne. Knowing this, one would be rash to deny that any disease resulting

from an inflammatory or sclerosing nature was not due to the invasion of these organisms, when they are known to be present in the blood stream.

It is a surprise to me that Dr. Ellery has been so upset by my statements, as if he had been reading the journals of the world (within reason) he would have found that the trend of medicine is gradually drifting towards my views and it does not look very brilliant to be the last on the list to acknowledge their truth. One can readily forgive him not finding them out for himself, but it does not require any really great mental penetration to see the truth or otherwise of them after they have been constantly rammed down his throat. I ask Dr. Ellery these two simple questions: If by chance he did take a culture from a tonsil and found that it harboured hæmolytic streptococci and his patient was suffering from some active kidney or heart trouble, does he think he has a ghost of a chance of curing that individual by any treatment whatsoever short of enucleating the tonsils? If he failed to do so, providing the patient was in a fit state, would he not be open to censure for neglecting the proper treatment? If he had two children with the same organisms in both their tonsils and one had acute nephritis and he was advised to have the sick child's tonsils removed, would he wait till the other one developed the same condition before having them removed or save his child the risk of developing that condition? Both Dr. Ellery and I are daily faced with this question.

Dr. Ellery raises the question of surgery in the treatment of disease. Nothing is more useful at our present juncture, but every infected gall-bladder, appendix, enlarged gland or ulcer that is removed is a reproach to us as physicians, and the road is now open to the elimination of these.

This closes my correspondence on the subject.

Yours, etc.,

SYDNEY PERN.

12, Collins Street,
Melbourne,
October 31, 1933.

THE DISTRICT NURSING ASSOCIATION.

SIR: The object of this letter is to invite medical practitioners of Sydney and suburbs to avail themselves more fully than they do at present of the services of the District Nurses in the home nursing of the sick poor. There are so many patients who for one reason or another must be treated in their own homes. The old and bed-ridden, the paralysed, the inoperable cancers, the chronic ulcers, all these suggest themselves. Then there is the patient who has been in hospital and needs further treatment. If he be a child, his mother must take him to and from the hospital at great cost of time and fares. Home treatment saves this and also relieves the hospital out-patient department.

The District Nurses are all fully qualified general (not obstetric) nurses and selected as suitable for this special work. Their home is at 36, Boyce Street, Glebe (telephone MW 1681), and application for their services should be made to the Matron (Miss MacGregor), giving details of name of patient, his residence, and the nature of his ailment. The Matron will then arrange for the necessary visits and nursing.

The districts at present served by district nurses are Newtown, Leichhardt, Redfern, Glebe, Edgecliff (including Woolloomooloo), Waverley (including Surry Hills), and North Sydney. This is a provisional arrangement; if the demand should justify it, the necessary nurses will be supplied as required.

This letter is written in the belief that the busy practitioner will often thankfully secure the services of a District Nurse, if only he knows how to do this.

Yours, etc.,

R. J. MILLARD,
Honorary Treasurer, District
Nurses' Association.

135, Macquarie Street,
Sydney,
November 1, 1933.

Books Received.

COMBINED TEXT-BOOK OF OBSTETRICS AND GYNÆCOLOGY FOR STUDENTS AND MEDICAL PRACTITIONERS, by J. M. M. Kerr, M.D., F.R.F.P. and S. F.C.O.G., J. H. Ferguson, M.D., LL.D., F.R.C.S., F.R.C.P., F.C.O.G., F.R.S., J. Young, M.D., F.R.C.S., F.C.O.G., and J. Hendry, M.A., B.Sc., M.B., F.R.F.P. and S. F.C.O.G.; Second Edition; 1933. Edinburgh: E. and S. Livingstone. Royal 8vo., pp. 1112, with 497 illustrations. Price: 35s. net.

THE HISTORY AND EPIDEMIOLOGY OF SYPHILIS, by W. A. Facey, A.M., M.D., LL.D.: 1933. London: Baillière, Tindall and Cox; Springfield (Illinois): Charles C. Thomas. Royal 8vo., pp. 125, with illustrations. Price: \$2.00 net.

Diary for the Month.

- Nov. 21.—New South Wales Branch, B.M.A.: Ethics Committee.
 Nov. 22.—Victorian Branch, B.M.A.: Clinical Meeting.
 Nov. 23.—New South Wales Branch, B.M.A.: Clinical Meeting.
 Nov. 24.—Queensland Branch, B.M.A.: Council.
 Nov. 28.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 Nov. 29.—Victorian Branch, B.M.A.: Council Meeting.
 Nov. 30.—New South Wales Branch, B.M.A.: Branch.
 DEC. 4.—New South Wales Branch, B.M.A.: Organisation and Science Committee.
 DEC. 5.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 DEC. 6.—Western Australian Branch, B.M.A.: Council.
 DEC. 6.—Victorian Branch, B.M.A.: Annual Meeting.
 DEC. 7.—South Australian Branch, B.M.A.: Council.
 DEC. 8.—Queensland Branch, B.M.A.: Branch (Annual).
 DEC. 12.—New South Wales Branch, B.M.A.: Ethics Committee.
 DEC. 14.—Victorian Branch, B.M.A.: Council.

Medical Appointments.

The undermentioned appointments have been made to the positions on the Honorary Medical Staff of the Coast Hospital, New South Wales. Honorary Physicians: Dr. H. Wilson (B.M.A.), Dr. R. Jeremy (B.M.A.), Dr. S. Rosebery (B.M.A.), Dr. E. W. Fairfax (B.M.A.), Dr. C. B. Blackburn (B.M.A.); Honorary Surgeons: Dr. T. M. Furber (B.M.A.), Dr. R. B. Wade (B.M.A.), Dr. J. C. Storey (B.M.A.), Dr. H. Bullock (B.M.A.), Dr. H. R. Darling (B.M.A.); Honorary Gynaecological Surgeon: Dr. R. Davies (B.M.A.); Honorary Orthopaedic Surgeon: Dr. W. Vickers (B.M.A.); Honorary Ear, Nose and Throat Surgeon: Dr. H. H. Johnston (B.M.A.); Honorary Urologist: Dr. R. J. Silverton (B.M.A.); Honorary Ophthalmic Surgeon: Dr. J. C. Halliday (B.M.A.); Honorary Dermatologist: Dr. E. H. Molesworth (B.M.A.); Honorary Radium Therapist: Dr. H. M. Moran (B.M.A.); Honorary Radiologist: Dr. P. Tillett (B.M.A.); Honorary Assistant Radiologist: Dr. K. Voss (B.M.A.); Honorary Consultants: Professor C. G. Lambie (B.M.A.) and Professor H. R. Dew (B.M.A.); Honorary Anaesthetist: Dr. P. S. Jones (B.M.A.).

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," pages xvi and xvii

- DIRECTOR-GENERAL OF PUBLIC HEALTH, SYDNEY, NEW SOUTH WALES: Medical Officer.
 HOBART PUBLIC HOSPITAL, HOBART, TASMANIA: Junior Resident Medical Officers.
 MATEIS MISERICORDIAE PUBLIC HOSPITAL, BRISBANE, QUEENSLAND: Honorary Assistant Urologist.
 PARRAMATTA DISTRICT HOSPITAL, PARRAMATTA, NEW SOUTH WALES: Junior Resident Medical Officer.
 ROCKHAMPTON HOSPITALS BOARD, ROCKHAMPTON, QUEENSLAND: Resident Medical Officer.
 THE HORNSBY AND DISTRICT HOSPITAL, HORNSBY, NEW SOUTH WALES: Honorary Officers.
 THE UNIVERSITY OF BRISTOL, ENGLAND: Chair of Anatomy.
 THE UNIVERSITY OF MELBOURNE, VICTORIA: Lecturer in Anatomy and Histology; Junior Part-Time Demonstrator.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr.
SOUTH AUSTRALIAN: Secretary, 297, North Terrace, Adelaide.	Combined Friendly Societies, Clarendon and Kangarilla districts. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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